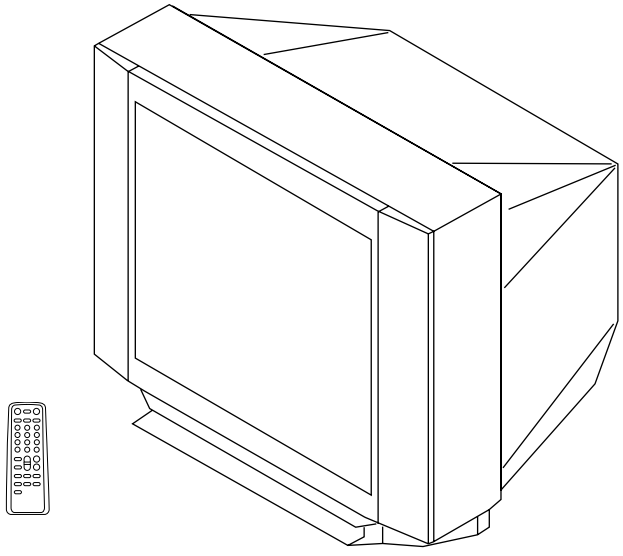
Self Diagnosis
Supported model

SERVICE MANUAL

BG-3S CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-2199M70	RM-952	ME	SCC-U30W-A				



TRINITRON® COLOR TV

SONY®

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SELF DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER lamp will automatically begin to flash.
The number of times the lamp flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER lamp flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

1. DIAGNOSTIC TEST INDICATORS

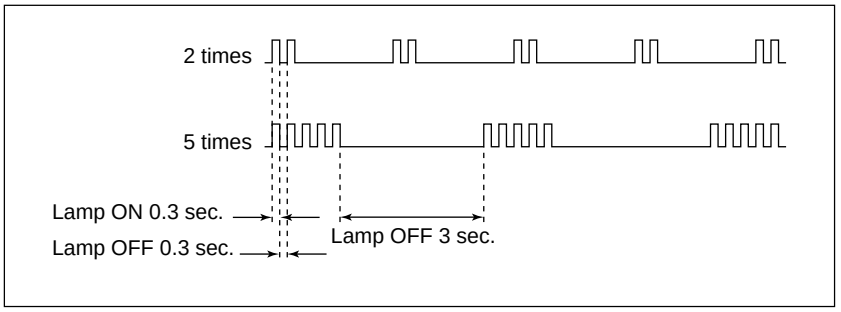
When an errors occurs, the STANDBY/TIMER lamp will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the lamp will identify the first of the problem areas.

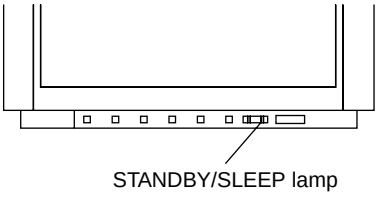
Result for all of the following diagnostic items are displayed on screen. No error has occured if the screen displays a "0".

Diagnostic Item Description	No. of times STANDBY/TIMER lamp flashes	Self-diagnostic display/Diagnostic result	Probable Cause Location	Detected Symptoms
• Power does not turn on	Does not light	—	• Power cord is not plugged in. • Fuse is burned out F4601 (F)	• Power does not come on. • No power is supplied to the TV. • AC power supply is faulty.
• +B overcurrent (OCP) or overvoltage (OVP) • Vertical deflection stopped • Horizontal deflection overdrive	2 times	002:000 or 002:001~255 003:001~255 004:001~255 at the same time	• H.OUT Q511 is shorted. (A board) • IC701 is shorted. (C board) • -13V is not supplied. (A board) • IC 503 faulty (A board)	• Power does not come on. • Load on power line is shorted. • Has entered standby state after horizontal raster. • Vertical deflection pulse is stopped. • Power line is shorted or power supply is stopped.
• White balance failure (no PICTURE)	5 times	005:000 or 005:001~225	• G2 is improperly adjusted. (Note 2) • CRT problem. • Video OUT IC701 is faulty. (C board) • IC301 is faulty. (A board) • No connection A board to C3 board.	• No raster is generated. • CRT cathode current detection reference pulse output is small.
• Micro reset	—	101:00 or 101:001~225	• Discharge CRT (C3 Board) • Static discharge • External noise	• Power is shut down shortly, after this return back to normal. • Detect Micro latch up.

Note 1: If a + B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously.
The symptom that is diagnosed first by the microcontroller is displayed on the screen.
Note 2: Refer to screen (G2) Adjustment in section 3-4 of this manual.

2. DISPLAY OF STANDBY/TIMER LIGHT FLASH COUNT





Diagnostic Item	Flash Count*
+B overcurrent/overvoltage Vertical deflection stopped	2 times
White balance failure	5 times

* One flash count is not used for self-diagnostic.

3. STOPPING THE STANDBY/TIMER FLASH

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER lamp from flashing.

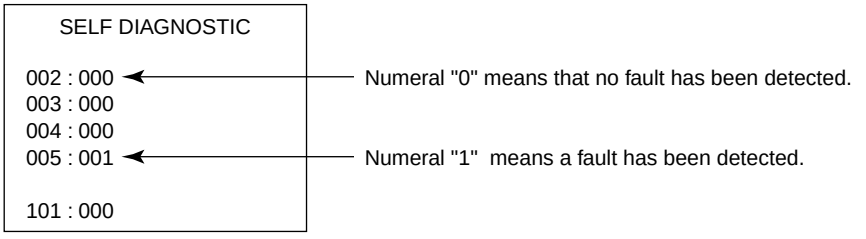
4. SELF-DIAGNOSTIC SCREEN DISPLAY

For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurances of failure for confirmation on the screen:

[To Bring Up Screen Test]
In standby mode, press buttons on the remote commander sequentially in rapid succession as shown below:

Screen display ➡ channel 5 ➡ Sound volume - ➡ Power ON
⇧
Note that this differs from entering the service mode (mode volume +).

Self-Diagnosis screen display


SELF DIAGNOSTIC
002 : 000
003 : 000
004 : 000
005 : 001
101 : 000
Numeral "0" means that no fault has been detected.
Numeral "1" means a fault has been detected.

5. HANDLING OF SELF-DIAGNOSTIC SCREEN DISPLAY

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to “0”.

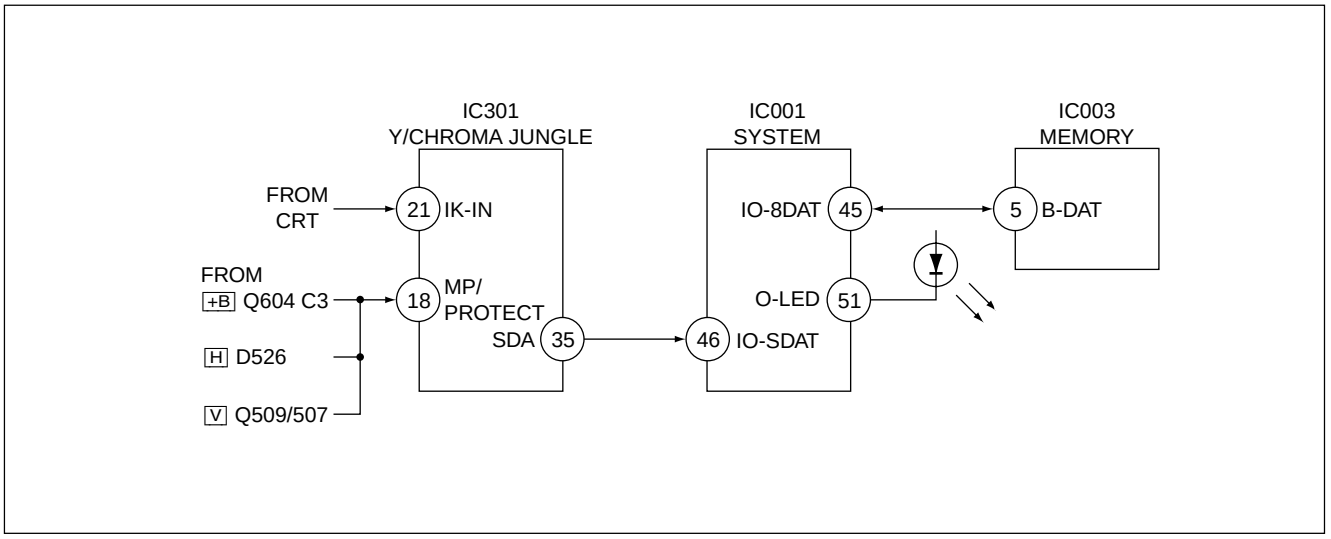
Unless the result display is cleared to “0”, the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

[Clearing the result display]
To clear the result display to “0”, press buttons on the remote commander sequentially as shown below when the diagnostic screen is being displayed.

Channel 8 ➡ 0

[Quitting Self-diagnostic screen]
To quit the entire self-diagnostic screen, turn off the power switch on the remote commander or the main unit.

6. SELF-DIAGNOSTIC CIRCUIT

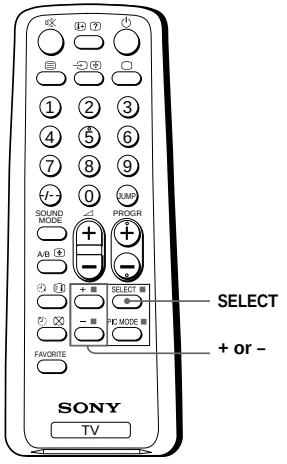


+B overcurrent (OCP)	Occurs when an overcurrent on the +B(135) line is detected by Q604. If Q604 go to ON and the voltage to pin 18 of IC301 should go down when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.
Horizontal deflection overdrive	Occurs when an overdrive on H drive line is detected by D526. Power supply will be shut down when detect it.
Vertical deflection stopped	Occurs when an absence of the vertical deflection pulse is detected by Q509 and IC001 shut down the power supply.
Vertical deflection overcurrent	Occurs when an overcurrent on V drive line is detected by Q507. Power supply will be shut down when detect this by IC001.
White balance failure	If the RGB levels* do not balance or become low level within 5 seconds, this error will be detected by IC301. TV will stay on, but there will be no picture.

* (Refers to the RGB levels of the AKB detection Ref pulse that detects IK.)

Blocking the channels (CHILD LOCK)

You can prevent a child from watching certain programs by using the buttons on the remote control.



1 Select the TV program you want to lock.

2 Press SELECT until "CHILD LOCK" appears on the screen.

3 Press + or – to select "ON".

The 🔒 symbol appears on the screen.

To unlock the channel, press + or – to select "OFF". The 🔒 symbol disappears from the screen.

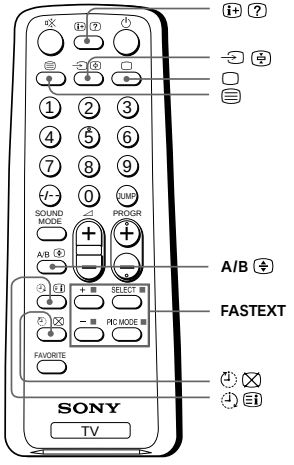
Note

- If you preset a locked channel, that particular channel will be unlocked automatically.

Viewing Teletext

(KV-2199XT only)

TV stations broadcast an information service called Teletext via some TV channels. Teletext allows you to receive various information, such as shares market or news.

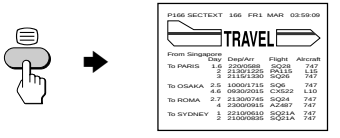


Displaying Teletext

1 Select a TV channel that carries the Teletext broadcast you want to watch.

2 Press ☰ to display the text.

A Teletext page (normally the index page) is displayed. If there is no Teletext broadcast, "100" is displayed at the top left corner of the screen.



To turn off Teletext

Press ▢.

Additional Teletext tasks

To	Do this
display a Teletext page on the TV picture	Press ☰. Each time you press ☰, the screen changes as follows: Teletext → Teletext and TV → TV.
check the contents of a Teletext service	Press ⏱ i. An overview of the Teletext contents and page numbers appear on the screen.
select a Teletext page	Press the number buttons to enter the three-digit page number of the desired Teletext page.* If you make a mistake, reenter the correct page number. To access the next or previous page, press PROGR +/–.
hold a Teletext page (stop the page from scrolling)	Press ⏎ ⇳ to display the symbol "⇳" at the top left corner of the screen. To resume normal Teletext operation, press ⏎ ⇳ or ☰.
reveal concealed information (e.g., an answer to a quiz)	Press i ?. To conceal the information, press the button again.
enlarge the Teletext display	Press A/B ⇕. Each time you press A/B ⇕, the Teletext display changes as follows: Enlarge upper half → Enlarge lower half → Normal size.
wait for a Teletext page while watching a TV program	1 Enter the Teletext page number that you want to refer to, then press ⏱ ⊠. 2 When the page number is displayed, press ☰ to show the text.

* You can also select a Teletext page of any page number that appears in the colored column at the bottom of the screen using the corresponding color-coded button on the remote.

Using FASTEXT

This feature allows you to quickly access a Teletext page that uses FASTEXT. When a FASTEXT program is broadcasted, the colored menus appear at the bottom of the screen. The colors of the menus correspond to the red, green, yellow, and blue color-coded buttons on the remote.

To access a FASTEXT menu

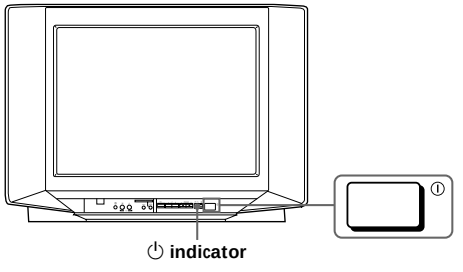
Press the color-coded button on the remote corresponding to the menu you want. The menu page appears on the screen after several seconds.

Additional Information

Self-diagnosis function

Your TV is equipped with a self-diagnosis function. If there is a problem with your TV, the ⏻ indicator flashes red. The number of times the ⏻ indicator flashes indicates the possible causes.

Front of TV



1 Check that the ⏻ indicator flashes red a number of times between 3-second intervals.

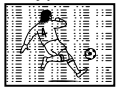
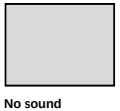
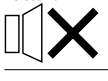
2 Count the number of times the ⏻ indicator flashes.

3 Press ⏻ (main power) to turn off your TV.

4 Inform your nearest Sony service center about the number of times the ⏻ indicator flashes.
Be sure to note the model name and serial number located on the rear of your TV.

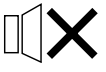
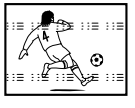
Troubleshooting

If you find any problem while viewing your TV, please check the following guide. If any problem persists, contact your Sony dealer .

Symptom	Solutions	Possible cause
Snowy picture  **Noisy sound** 	• Check the antenna cable and connection on the TV, VCR and on the wall. (page 4)	• Connection is loose or the cable is damaged.
	• Press SELECT until "MANUAL PROGRAM" appears on the screen then preset the channel again. (page 9)	• Channel presetting is inappropriate or incomplete.
	• Check the antenna type (VHF/UHF). Contact a Sony dealer for advice.	• The antenna type is inappropriate.
	• Adjust the antenna direction. Contact a Sony dealer for advice.	• The antenna direction is inappropriate.
	• Try using a booster.	• Signal transmission is low.
Distorted picture **Noisy sound** 	• Turn off or disconnect the booster if it is in use.	• Broadcast signals are too strong.
Good picture **Noisy sound** **(KV-2199M70 only)**	• If the sound of some channels are noisy, select the channel, then select the appropriate TV system ("TV SYS"). (page 9)	• The TV system setting is inappropriate.
No picture  **No sound** 	• Check the power cord, antenna and the VCR connections.	• The power cord, antenna or VCR is not connected.
	• Press ⏻ (power). • Press ⏀ (main power) on the TV to turn off the TV for about five seconds, then turn it on again.	• The TV is not turned on.

continued

Troubleshooting (continued)

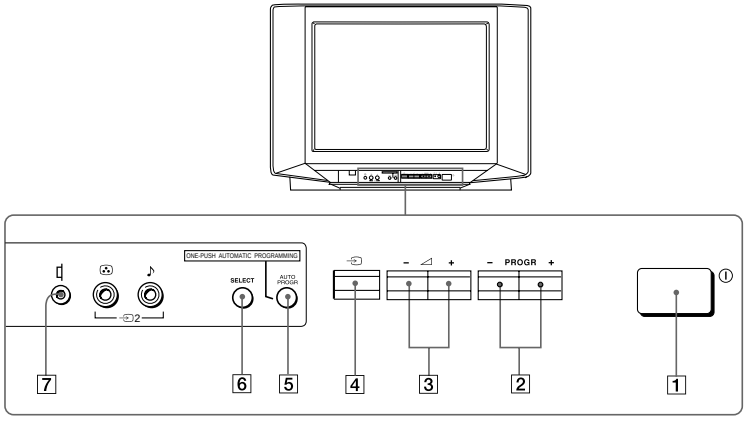
Symptom	Solutions	Possible cause
Good picture **No sound** 	• Press ◿ + to increase the volume level.	• The volume level is too low.
	• Press 🔇 to cancel the muting.	• The sound is muted.
Dotted lines or stripes 	• Do not use a hair dryer or other equipment near the TV. • Adjust the antenna direction for minimum interference. Contact a Sony dealer for advice.	• There is local interference from cars, neon signs, hair dryers, power generators, etc.
Double images or "ghosts" 	• Use a highly directional antenna. • Use the fine tuning (FINE) function. (page 10)	• Broadcast signals are reflected by nearby mountains or buildings.
	• Adjust the antenna direction. Contact a Sony dealer for advice.	• The antenna direction is inappropriate.
	• Turn off or disconnect the booster if it is in use.	• Use of a booster is inappropriate.
No color 	• Press SELECT until "COLOR" appears on the screen, then press + or – to adjust the color level. (page 15)	• The color level setting is too low.
	• Press SELECT until "COL SYS " appears on the screen, then check the color system setting (usually set this to "AUTO"). (page 10)	• The color system setting is inappropriate.
	• Adjust the antenna direction. Contact a Sony dealer for advice.	• The antenna direction is inappropriate.
Abnormal color patches 	• Keep external speakers or other electrical equipment away from the TV. Do not move the TV while the TV is turned on. Press ⏀ (main power) on the TV to turn off the TV for about five minutes, then turn it on again.	• The magnetic disturbance from external speakers or other equipment, or the direction of the earth's magnetic field may affect the TV.

Symptom	Solutions	Possible cause
"100" appears on the top of the screen and there is no Teletex display. (KV-2199XT only)	—	• The channel carries no Teletext broadcast.
Teletext display is incomplete (snowy picture or double images). (KV-2199XT only)	• Check the antenna cable and connection on the TV, VCR, and at the wall. (page 4)	• Connection is loose or the cable is damaged.
	• Adjust the antenna direction. Contact a Sony dealer for advice.	• The antenna direction is inappropriate.
	• Try using a booster • Use the fine tuning (FINE) function. (page 10)	• Signal transmission is too low.
Picture slant (KV-2199XT only)	• Keep external speakers or other electrical equipment away from the TV. • Press SELECT until "PIC ROTATION" appears on the screen, then press + or – to align the picture to the TV screen. (page 12) (KV-2199XT only)	• The magnetic disturbance from external speakers or other equipment, or the direction of the earth's magnetic field may affect the TV.
Lines moving across the TV screen	• Use the fine tuning (FINE) function. (page 10)	• There is interference from external sources, e.g., heavy machineries, nearby broadcast station.
The ⏻ indicator on your TV flashes red a number of times between 3-second intervals.	• Contact your nearest Sony service center. (page 20)	• Your TV may need service.
TV cabinet creaks.	—	• Changes in room temperature sometimes make the TV cabinet expand or contract, making a noise. This does not indicate a malfunction.
A "boom" sound is heard when the TV is turned on.	—	• The TV's demagnetizing function is working. This does not indicate a malfunction.

Identifying parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel

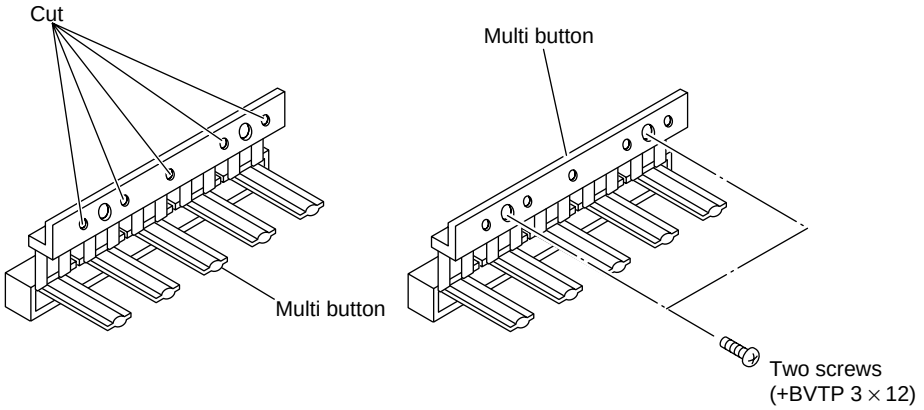


1 ⏻ (main power) button (11)
2 PROGR +/– (program) buttons (11)
3 +/– (volume) buttons (11)
4 (TV/video) button (12)
5 AUTO PROGR (program) button (5)
6 SELECT button (10)
7 (earphone) jack

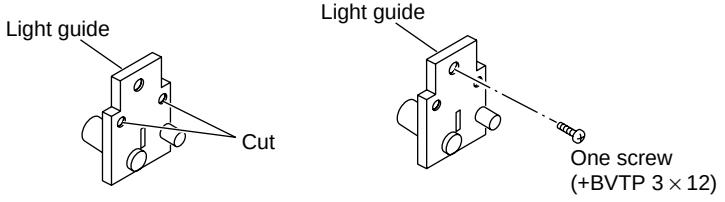
2-5. REPLACEMENT OF PARTS

For replacement of the Multi Button and Light Guide, cut the welded portions from them, exchange with the new parts, and fix them with screws (+BVTP) respectively.

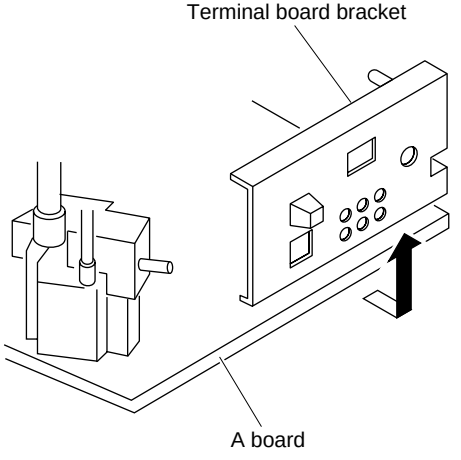
2-5-1. REPLACEMENT OF MULTI BUTTON



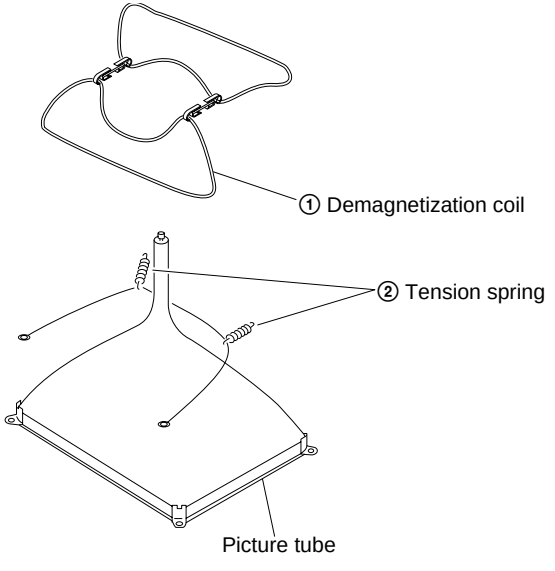
2-5-2. REPLACEMENT OF LIGHT GUIDE



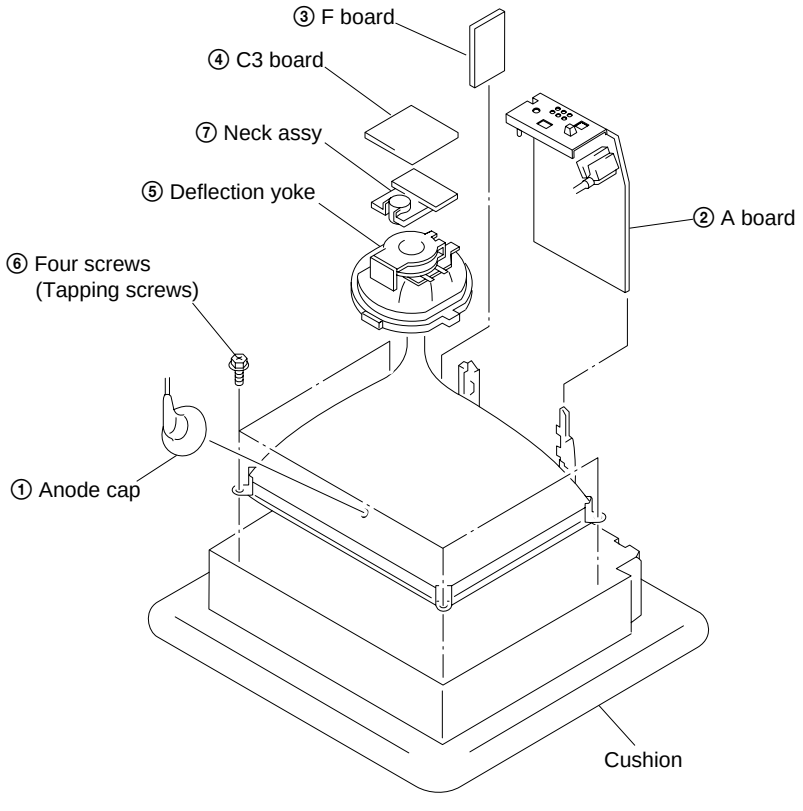
2-6. TERMINAL BRACKET REMOVAL



2-7. DEGAUSS COIL REMOVAL



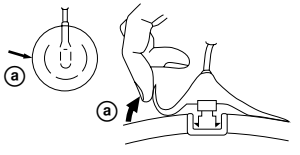
2-8. PICTURE TUBE REMOVAL



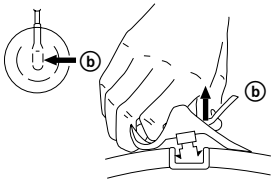
• REMOVAL OF ANODE-CAP

NOTE : After removing the anode, short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT.

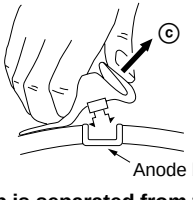
• REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



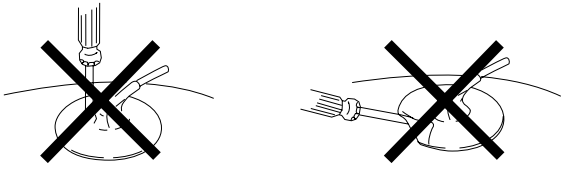
② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ.

• HOW TO HANDLE AN ANODE-CAP

① Do not damage the surface of anode-caps with sharp shaped objects.
② Do not press the rubber too hard so as not to damage the inside of anode-cap. A metal fitting called the shatter-hook terminal is built into the rubber.
③ Do not turn the foot of rubber over too hard. The shatter-hook terminal will stick out or damage the rubber.



SECTION 3
SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

Controls and switches should be set as follows unless otherwise noted:
PICTURE control ..... normal
BRIGHTNESS control ..... normal

Perform the adjustments in the following order :

1. Beam Landing
2. Convergence
3. Focus
4. White Balance

Note : Test Equipment Required.

1. Color-bar/Pattern Generator
2. Degausser
3. Oscilloscope

Preparation :

- In order to reduce the influence of geomagnetism on the set's picture tube, face it east or west.
- Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input a white signal with the pattern generator.
   Contrast } normal
   Brightness
2. Position neck assy as shown in Fig3-2.
3. Set the pattern generator raster signal to a green raster.
4. Move the deflection yoke to the rear and adjust with the purity control so that the green is at the center and the blue and the red take up equally sized areas on each side.
   (See Figures 3-1 through 3-3.)
5. Move the deflection yoke forward and adjust so that the entire screen is green. (See Figure 3-1.)
6. Switch the raster signal to blue, then to red and verify the condition.
7. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws and DY spacers.
8. If the beam does not land correctly in all the corners, use a magnet to adjust it.
   (See Figure 3-4.)

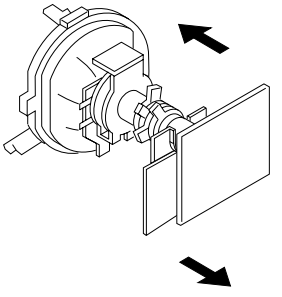
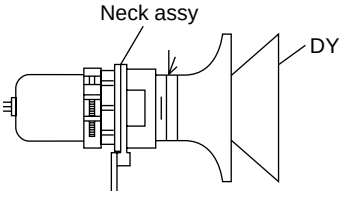


Fig. 3-1



Note:
Neck Assy is exactly behind DY (no gap between Neck Assy and DY)

Fig. 3-2

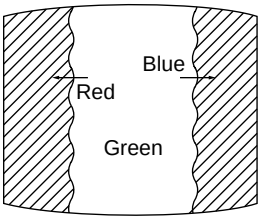


Fig. 3-3

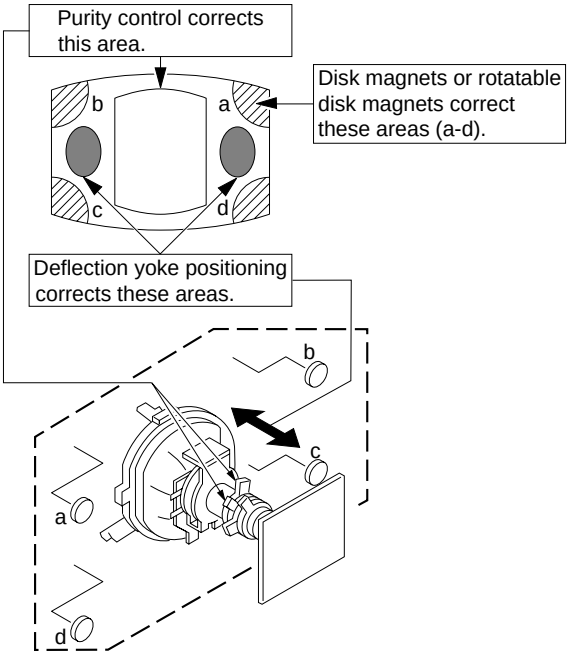


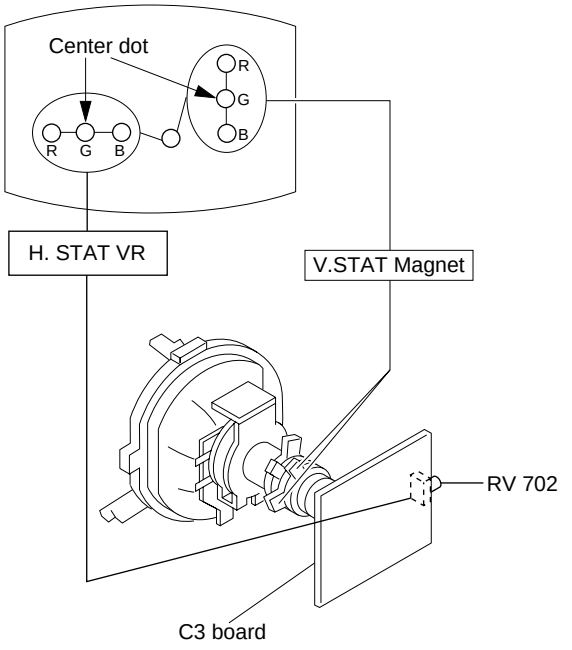
Fig. 3-4

3-2. CONVERGENCE

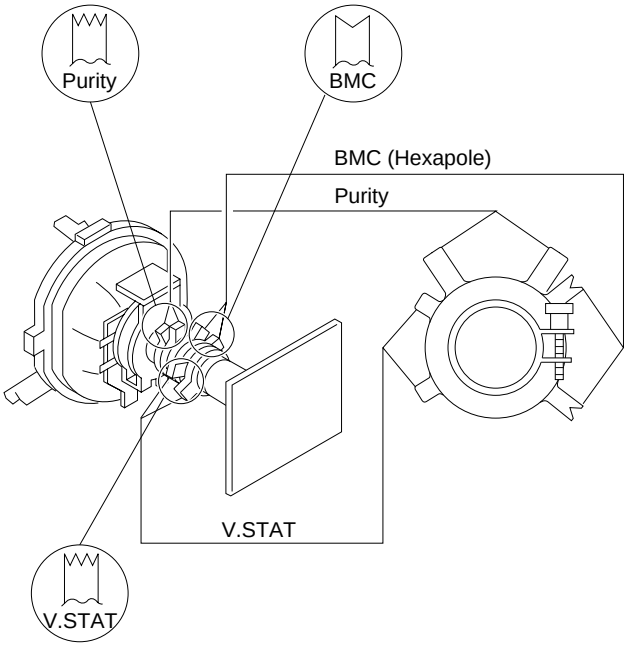
Preparation :

- Before starting this adjustment, adjust the focus, horizontal size and vertical size.
- Minimize the brightness setting.
- Provide dot pattern.

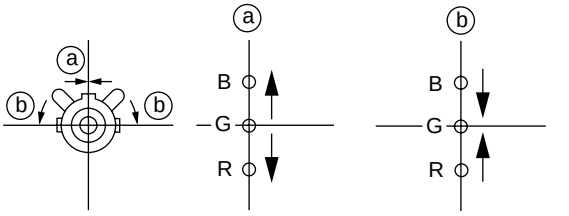
(1) Horizontal and Vertical Static Convergence



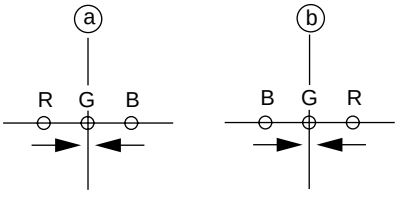
(Moving vertically), adjust the V.STAT magnet so that the red, green and blue dots are on top of each other at the center of the screen.



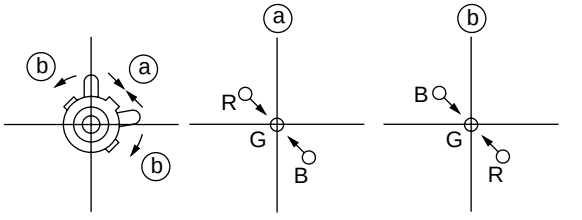
① V. STAT



② H. STAT VR

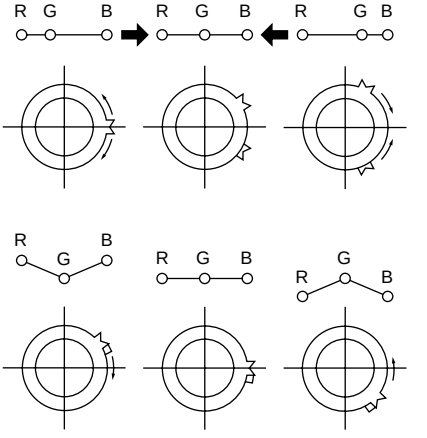


③



④ BMC (Hexapole) Magnet.

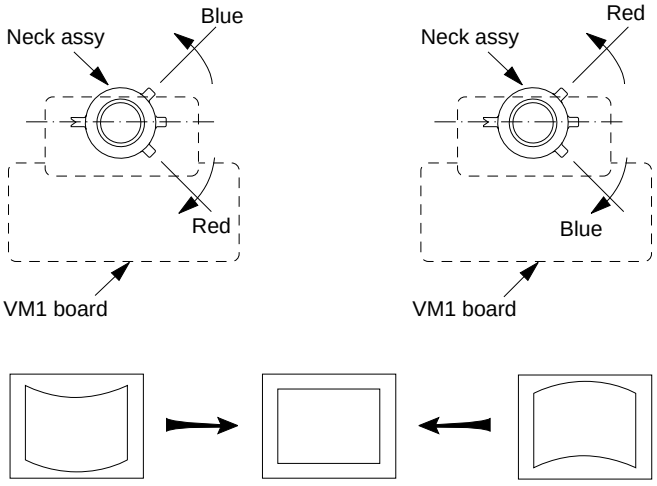
If the red, green and blue dots are not balanced or aligned, then use the BMC magnet to adjust in the manner described below.



④ Y separation axis correction magnet adjustment.

1. Receive the cross-hatch signal and adjust [PICTURE] to [MIN] and [BRIGHTNESS] to [STANDARD] .

2. Adjust the Y separation axis correction magnet on the neck assembly so that the horizontal lines at the top and bottom of the screen are straight.



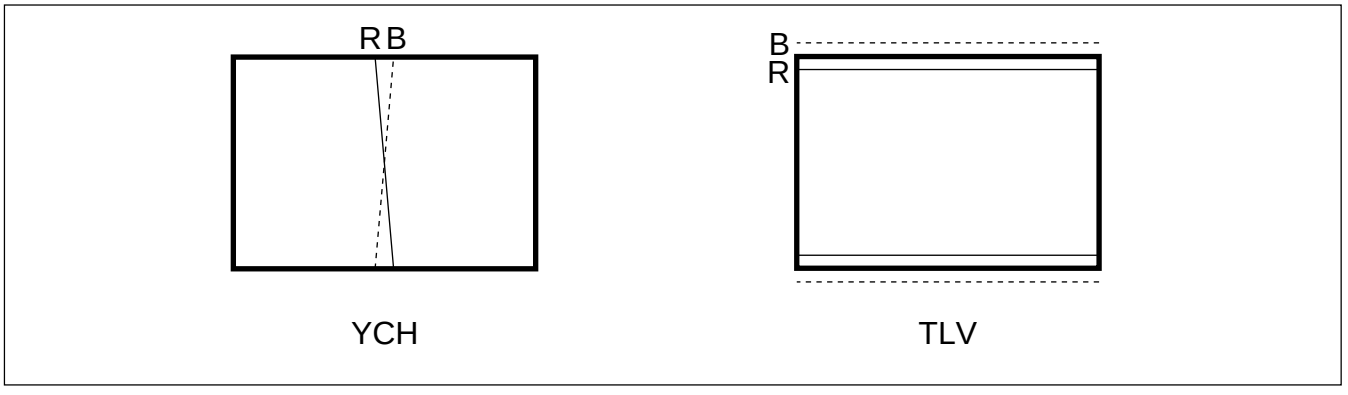
Note

1. The Red and Blue magnets should be equally far from the horizontal center line.
2. Do not separate the Red and Blue magnets too far. (Less than 8 mm)

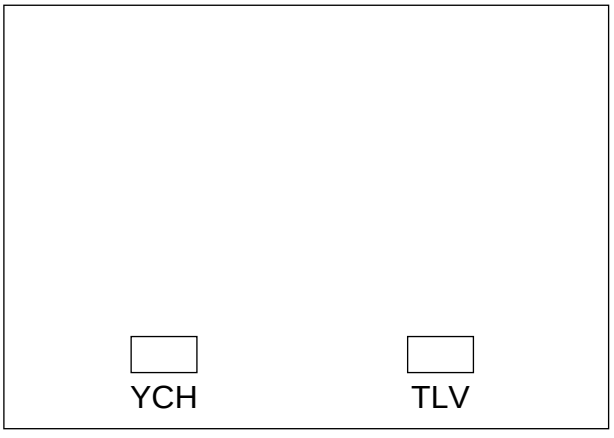
(2) Dynamic Convergence Adjustment

Preparation:

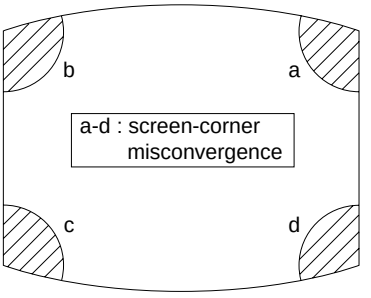
- Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence



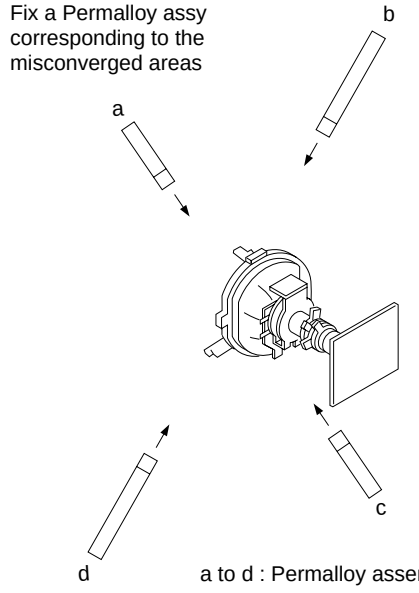
on DY



(3) Screen-corner Convergence

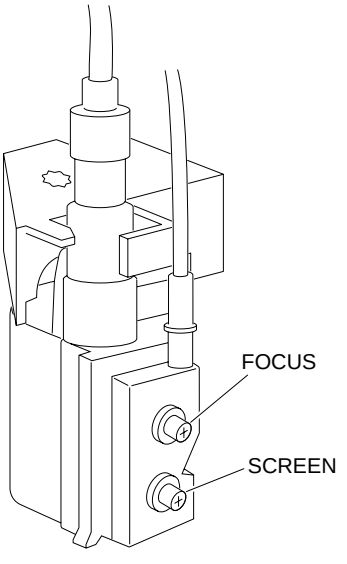


Fix a Permalloy assy corresponding to the misconverged areas.



3-3. FOCUS ADJUSTMENT

Adjust FOCUS control on the flyback transformer for the best focus.

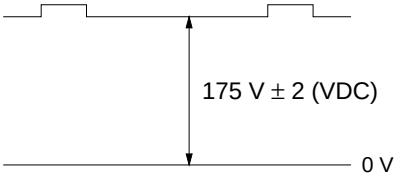


FLYBACK TRANSFORMER (T503)

3-4. G2 (SCREEN) AND WHITE BALANCE ADJUSTMENTS

1. G2 (SCREEN) ADJUSTMENT

1) Set the PICTURE to normal.
2) Put to VIDEO input mode without signals.
3) Connect R, G and B of the C3 board cathode to the oscilloscope.
4) Adjust BRIGHTNESS to obtain the cathode voltage to the value below.
5) Adjust G2 (Screen) on FBT until picture shows the point before cut-off.

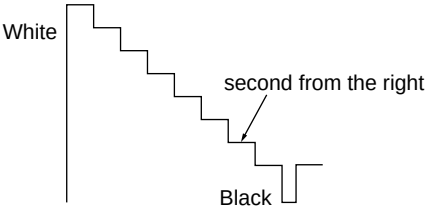


2. WHITE BALANCE ADJUSTMENT

1) Set to Service Mode (Refer Section 4-1: ADJUSTMENTS WITH COMMANDER).
2) Input white raster signal.
3) Set the PICTURE to minimum.
4) Select GCT (WHB 4) and BCT (WHB 5) with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
5) Set the PICTURE to maximum.
6) Select GDR (WHB 1) and BDR (WHB 2) with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
7) Write into the memory by pressing [MUTING] then [0].

3. SUB BRIGHT ADJUSTMENT

1) Set to service mode.
2) Input a staircase signal of black to white from the pattern generator.
3) BRIGHTNESS .... 50%.
   PICTURE ..... MINIMUM
4) Select SBR (WHB7) with [1] and [4], and adjust SBR (WHB7) level with [3] and [6] so that the second stripe from the right is dimly lit.



SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ADJUSTMENTS WITH COMMANDER

Service adjustments are made with the RM-952 that comes with this unit.

a. ENTERING SERVICE MODE

With the unit on standby
↓
[DISPLAY]
↓
[5]
↓
[VOL (+)]
↓
[POWER]

This operation sequence puts the unit into service mode.

b. METHOD OF CANCELLATION FROM SERVICE MODE

Set the standby condition (Press [POWER] button on the commander), then press [POWER] button again, hereupon it becomes TV mode.

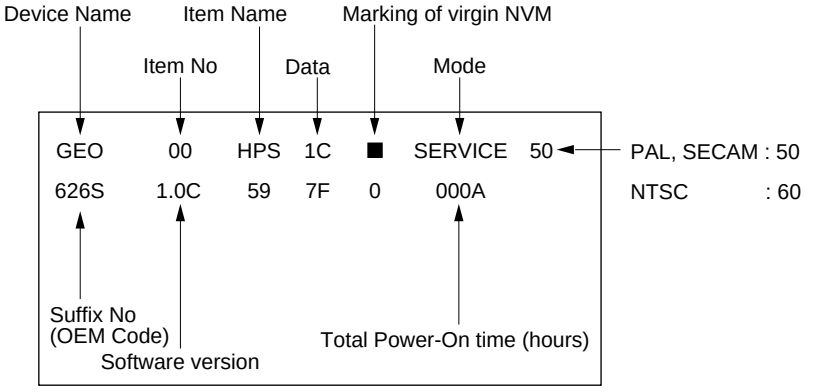
c. METHOD OF WRITE INTO MEMORY

1) Set to Service Mode.
2) Press [1] (UP) and [4] (DOWN), select an item of adjustment.
3) Press [MUTING] button and it will indicate WRITE on the screen.
4) Press [0] button to write into memory.

d. MEMORY WRITE CONFIRMATION METHOD

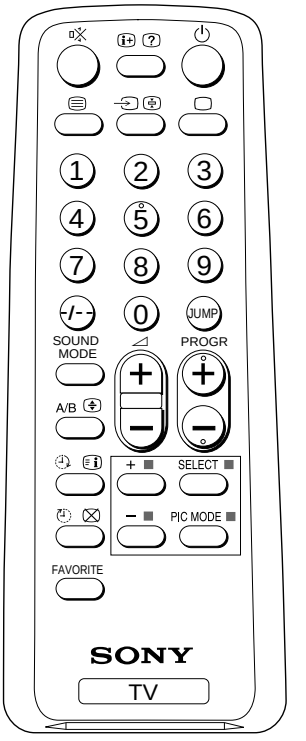
1) After adjustment, pull out the plug from AC outlet, and then plug into AC outlet again.
2) Turn the power switch ON and set to Service Mode.
3) Call the adjusted items again to confirm adjustments were made.

The screen display is :



[1], [4] ↓	Select the adjustment item.
[3], [6] ↓	Raise/lower the data value.
[MUTING] ↓	Writes.
[0]	Executes the writing.

[7], [0]	All the data becomes the values in memory.
[8], [0]	All user control goes to the standard state.
[5], [0]	Service data initialization (Be sure not to use usually.)
[2], [0]	Write 50Hz adjustment data to 60Hz, or vice versa.



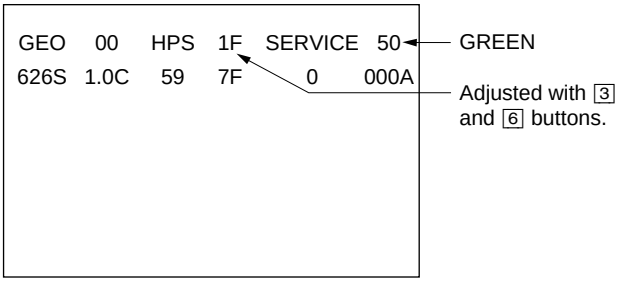
RM-952

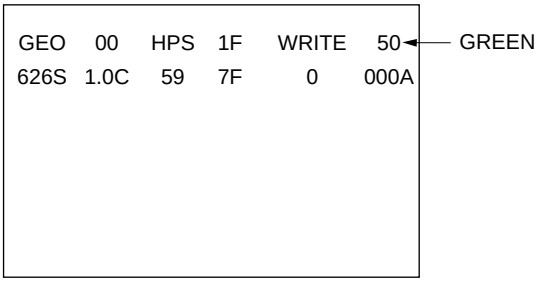
4-2. ADJUSTMENT METHOD

Item Number 00 of device GEO

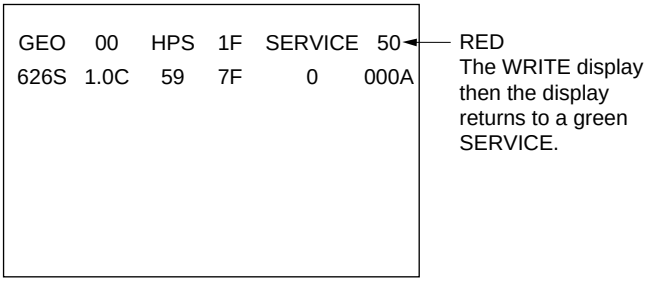
This explanation uses H-Position as an example.

1. Select “GEO 00 HPS” with the [1] and [4] buttons.
2. Raise/lower the data with the [3] and [6] buttons.
3. Select the optimum state. (The standard is 1F for PAL reception.)
4. Write with the [MUTING] button. (The display changes to WRITE.)
5. Execute the writing with the [0] button. (The WRITE display will be changed to red color while excuting, and back to SERVICE.)





Written with [MUTING]



Write executed with [0]

Use the same method for all Items. Use [1] and [4] to select the adjustment item, use [3] and [6] to adjust, write with [MUTING], then execute the write with [0].

Note : 1. In [WRITE], the data for all items are written into memory together.

2. For adjustment items that have different standard data between 50Hz or 60Hz, be sure to use the respective input signal after adjustment.

Adjustment Item Table

Device Name	Functionality No	Functionality Name	Note	Data Range	Function	Note for Different Data	Register No. (bit)	Slava Address	RAM Address (bit)
GEO	0	HPS	1E/16	3F	H Position	50/60HZ	12 (7-2)	CXA2130S(88H)	82 (7-2)
	1	HSZ	1F	3F	H Size	50/60HZ	11 (7-2)		81 (7-2)
	2	PAP	1F	3F	Pin Amp	50/60HZ	13 (7-2)		83 (7-2)
	3	TLT	7	0F	Trapezium	50/60HZ	15 (7-4)		86 (7-4)
	4	VPS	1F	3F	V Position	50/60HZ	0F (7-2)		7F (7-2)
	5	VSZ	1F	3F	V Size	50/60HZ	0E (7-2)		7E (7-2)
	6	SCO	7	0F	S Correction	50/60HZ	10 (7-4)		80 (7-4)
	7	VLN	7	0F	V Linearity	50/60HZ	10 (3-0)		80 (3-0)
	8	BOW	7	0F	AFC Bow	50/60HZ	16 (7-4)		86 (7-4)
	9	AGL	7	0F	AFC-Angle	50/60HZ	16 (3-0)		86 (3-0)
	0A	UPN	1F	3F	Upper Pin	50/60HZ	14 (7-2)		84 (7-2)
	0B	LPN	2F	3F	Lower Pin	50/60HZ	18 (7-2)		88 (7-2)
	0C	HBL	1	1	H Blanking on/off		18 (1)		67 (1)
	0D	LBL	0F	0F	Left H Blanking	50/60HZ	17 (7-4)		87 (7-4)
	0E	RBL	0F	0F	Right H Blanking	50/60HZ	17 (3-0)		87 (3-0)
WHB	0	RDR	25/2A	3F	R Drive	DYNAMIC/others	09 (7-2)	CXA2130S(88H)	8F (7-2)
	1	GDR	2A	3F	G Drive	DYNAMIC/others	0A (7-2)		90 (7-2)
	2	BDR	2A	3F	B Drive	DYNAMIC/others	0B (7-2)		91 (7-2)
	3	RCT	7	0F	R Cutoff	SECAM/others	07 (3-0)		93 (3-0)
	4	GCT	7	0F	G Cutoff	SECAM/others	08 (7-4)		94 (7-4)
	5	BCT	7	0F	B Cutoff	SECAM/others	08 (3-0)		94 (3-0)
	6	BMN	15	1F	Brightness Minimum Data				95
	7	SBR	28	3F	Sub Brightness Control				98
SAJ	0	PMX	37	3F	Picture Maximum Data			CXA2130S(88H)	95
	1	SHU	8	0F	Sub Hue Control	TV/Video			99
	2	SSH	3	0F	Sub Sharpness Control	TV/Video			9A
	3	SCL	1F	3F	Sub Color Control	NTSC/others			9B
VP	0	EHT	07	0F	EHT Comp	50/60HZ	15 (3-0)	CXA2130S(88H)	85 (3-0)
	1	GMA	2	03	Gamma Correction	NTSC/others	0B (1-0)		1A1 (1-0)
	2	YDL	08/07/08	0F	Y Delay	PAL/SECAM/NTSC	0C (3-0)		8C (3-0)
	3	SST	1	03	SECAM ID Start Position		1B (1-0)		6A (1-0)
	4	SSP	1	03	SECAM ID Stop Position		1B (3-2)		6A (3-2)
	5	SLV	2	03	SECAM ID Level		1C (1-0)		6B (1-0)
	6	SBF	22	3F	SECAM BELL fO		1C (7-2)		6B (7-2)
	7	DYC	1	1	Dynamic Color on/off		0A (1)		59 (1)
	8	ABL	1	1	ABL Mode Switching (except STANDARD)		09 (1)		58 (1)
	9	VTH	1	1	ABL Detection Vth Switching		09 (0)		58 (0)
	0A	SFO	1	1	FO Switching for Sharpness	NTSC/others	05 (1)		196 (1)
	0B	DCX	1	1	DC Trans. Ratio Switching		06 (1)		55 (1)
	0C	SHT	1	1	Pre-/Overshoot ratio Switch	NTSC/others	06 (0)		197 (0)

Adjustment Item Table

Device Name	Functionality No	Functionality Name	Note	Data Range	Function	Note for Different Data	Register No. (bit)	Slava Address	RAM Address (bit)
VP	0D	HDW	0	1	H Drive Pulse Width Switch		00 (6)		4F (6)
	0E	AFC	01/00/01	03	AFC Gain Control	TV/Video	0F (1-0)		8D (1-0)
	0F	HOS	7	0F	H Oscillation		0C (7-4)		5B (7-4)
	10	HSS	0	1	Slice Level of H Sync Sep.		0D (1)		5C (1)
	11	VSS	0	1	Slice Level of V Sync Sep.		0D (0)		6C (0)
	12	HMS	1	1	Macro Vision C/m off/on	50/60Hz	0E (0)		7E (0)
	13	YUV	1	1	YUV Switch Control		01 (0)		50 (0)
	14	CDV	1	3	CD mode for Video	Video only	0D (5-4)		19F (5-4)
	15	RON	1	1	R ON	not memorized	01 (3)		50 (3)
	16	GON	1	1	G ON	not memorized	01 (2)		50 (2)
	17	BON	1	1	B ON	not memorized	01 (1)		50 (1)
	18	PON	1	1	P ON	not memorized	00 (7)		4F (7)
	19	BLK	0	1	BLK Off		12 (0)		61 (0)
	1A	VMC	0	1	VM Off		13 (0)		62 (0)
AP	0	INF	5	3F	Input Attenuation When surround on		00 (5-0)	TDA7429	19D (5-0)
	1	INS	0A	3F	Input Attenuation When surround off				19E (5-0)
	2	PH1	3	3	Phase 1 Register Selection		02		76 (1-0)
	3	PH2	0	3	Phase 2 Register Selection				76 (3-2)
	4	PH3	0	3	Phase 3 Register Selection				76 (5-4)
	5	PH4	0	3	Phase 4 Register Selection				76 (7-6)
	6	BCS	2	3	Bass Center Shift		#4 (3-0)		1A8 (1-0)
	7	TCS	2	3	Treble Center Shift		#5 (3-0)		1A9 (1-0)
	8	TRF	2	3	RF Treble Offset		#5 (3-0)		1A9 (5-4)
MSP	0	WST	15	FF	W/G Stereo Threshold			MSP3415D(84H)	157 (7-0)
	1	WBT	EA	FF	W/G Bilingual Threshold				158 (7-0)
	2	WLL	5	FF	W/G Monaural Threshold				159 (7-0)
	3	WAC	0	0F	W/G Agreement Count				15A (3-0)
	4	WDL	30	FF	W/G Search Delay				15B (7-0)
	5	NDL	20	FF	NICAM Search Delay				15C (7-0)
	6	SDL	10	FF	Stereo status Read Delay				15D (7-0)
	7	AGC	1	1	AGC Switch Auto/Constant		BB (7)		108 (7)
	8	REL	28	3F	AGC Gain at Constant Mode		BB (6-1)		108 (6-1)
	9	CRM	0	1	Carrier muting on/off		BB (9)		107 (9)
	0A	ACO	1	1	Audio Clock out on/off		83 (5)		10C (5)
	0B	FP	1B	7F	FM Prescale for non-M system		0E (7-0)		16C (6-0)
	0C	FPM	32	7F	FM Prescale for M system		0E (7-0)		16D (6-0)
	0D	FH	36	7F	FM Prescale for HDEV		0E (7-0)		16E (6-0)
	0E	FHM	65	7F	FM Prescale for HDEV and M		0E (7-0)		16F (6-0)
	0F	WGP	2A	7F	W/G Prescale		0E (7-0)		170 (6-0)
	10	NIP	6D	7F	NICAM Prescale		10 (7-0)		138 (6-0)
	11	ERR	50	FF	Auto FM switch Threshold		21 (10-3)		166 (7-0)
	12	VOL	6D	FF	Loud Speaker gain 7000h to 7ffoh		0000 (15-4)		1A7 (7-0)

Adjustment Item Table

Device Name	Functionality No	Functionality Name	Note	Data Range	Function	Note for Different Data	Register No. (bit)	Slava Address	RAM Address (bit)
TXT	0	TXH	1	3	Teletext Horizontal Position			(58H)	18D (6-4)
	1	TXV	0	7	Teletext Vertical Position				18D (1-0)
OPM	0	OSH	0A	3F	OSD H Position	Option-Misc			AC (7-2)
	1	COM	0	03	Comb Selection				A5 (7-6)
	2	APC	1	1	APC Switch				A4 (5)
	3	TSY	0	03	TV Sys at Auto TV Sys				A4 (4-3)
	4	MUT	0	1	No Signal Mute				A4 (0)
	5	AFM	1	1	Auto FM switch				A4 (1)
	6	RFB	0	3	C-BPF Control				A4 (5-4)
	7	DBL	0	1	Disable Blueback Function				A4 (2)
OPB	0	OP1	FF	FF	Optional Bits 1 (see below)	Option-Bits			45
	1	OP2	E3	FF	Optional Bits 2 (see below)				46
	2	OP3	0	FF	Optional Bits 3 (see below)				47

NOTE

- shaded items are fixed data.
- Standard data listed on the Adjustment Item Table are reference values, therefore it may be different for each model and for each mode.
- Note for Different Data Those are the standard data values written on the microprocessor. Therefore, the data values of the modes and stored respectively in the memory.
  In case of a device replacement, adjustment by rewriting the data value is necessary for some items.

ITEM INFORMATION.

No. OPB0 OP1

Item	XTAL 4.43	XTAL 3.58	SECAM	2nd. Lang	B/G	I	D/K	M
KV-2199M70	1	1	1	1	1	1	1	1

No. OPB1 OP2

Item	TOP	NICAM	HDEV	Thai Bil	–	DVD Input	AV Input	
KV-2199M70	0	0	0	0	0	0	1	0

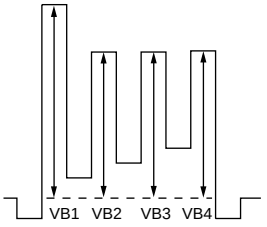
No. OPB2 OP3

Item	Pic Rot	2199 Curve	Auto PIC	Auto TV sys	US ST	Arabic	11 KEY	Chinese
KV-2199M70	0	1	1	0	0	1	0	0

4-3. PICTURE QUALITY ADJUSTMENTS

SUB COLOR ADJUSTMENT

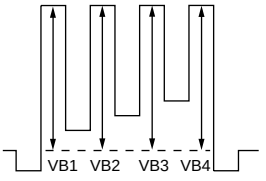
1. Input a PAL color-bar.
2. Set to the following condition:
   PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
3. Connect an oscilloscope to pin ① (B OUT) of CN305, A board.
4. Set to Service Mode and select SAJ 3 'SCL' with [1] and [4] of the commander then adjust to VB2=VB3=VB4 with [3] and [6].
5. Press [MUTING] → [0] of the commander to write the data.
6. Adjust SAJ 3 'SCL' as step 2 to 5 when receiving NTSC color-bar.



VB2 = VB3 = VB4

SUB HUE ADJUSTMENT

1. Select Video 1.
2. Input a NTSC color-bar, video into Video 1.
3. Set the following condition:
   PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
4. Connect an oscilloscope to pin ① (B OUT) of CN305, A board.
5. Select SAJ 1 'SHU' with [1] and [4] of the commander by setting to Service Mode and adjust to VB1=VB2=VB3=VB4 with [3] and [6].

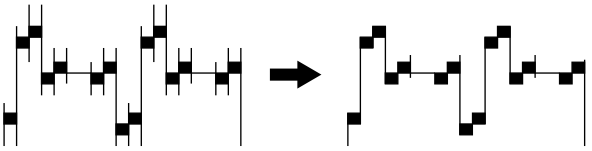


VB1 = VB2 = VB3 = VB4

6. Press [MUTING] → [0] of the commander to write the data.

BELL FILTER ADJUSTMENT

1. Input SECAM color-bar signal.
2. Connect the dual-trace oscilloscope to the pin ⑨ (R-Y) of CN303 (not mounted).
3. Adjust SERVICE MODE, ITEMS 'SBF' as shown below.



4-4. A BOARD ADJUSTMENT AFTER IC003 (MEMORY) REPLACEMENT

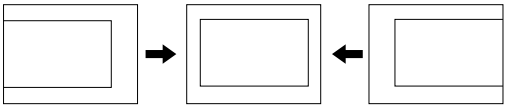
When replacing IC003 (MEMORY), be sure to change IC001 (µ-COM) to the following new IC at the same time.
IC001(µ-CON): CXP86449-626S

1. Enter to Service Mode.
2. Press commander buttons [5] and [0] (Data Initialize), and [2] and [0] (Data Copy) to initialize the data.
3. Call each item number and check if the respective screen shows the normal picture.
   In cases where items are not well adjusted, rectify the items with fine adjustment.
   Write the data per each item number ([MUTING] +[0]).
4. Select item numbers "OPB0" (OP1), "OPB1" (OP2) and "OPB2" (OP3) and respectively set the bit per model with command buttons [3] and [6].
5. Press commander buttons [8] and [0] (Test Normal) to return to the data that was set on the shipment from the factory.
   (This will also cancel Service Mode.)

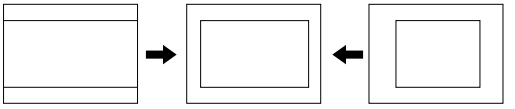
4-5. PICTURE DISTORTION ADJUSTMENT

Item Number 00 – 0B

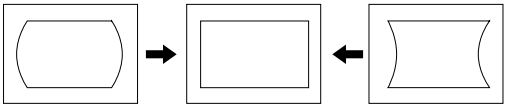
GEO 0 HPS (H POSITION)



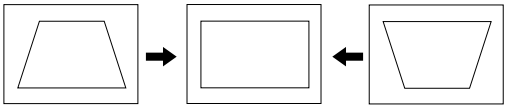
GEO 1 HSZ (H SIZE)



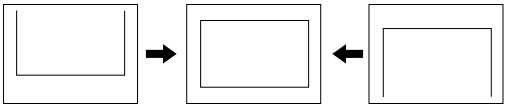
GEO 2 PAP (PIN AMP)



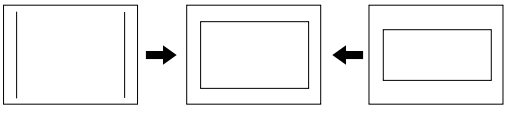
GEO 3 TLT (TRAPEZIUM)



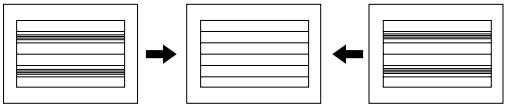
GEO 4 VPS (V POSITION)



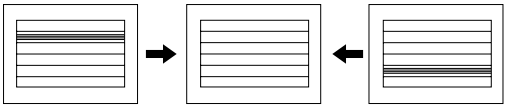
GEO 5 VSZ (V SIZE)



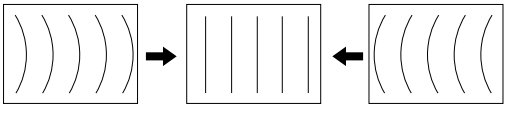
GEO 6 SCO (VERTICAL S-Correction)



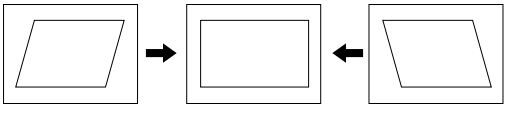
GEO 7 VLN (V LINEARITY)



GEO 8 BOW (AFC.BOW)

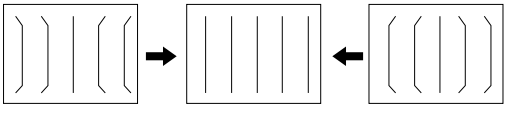


GEO 9 AGL (AFC.ANGLE)



GEO 0A UCP (UPPER CORNER PIN)

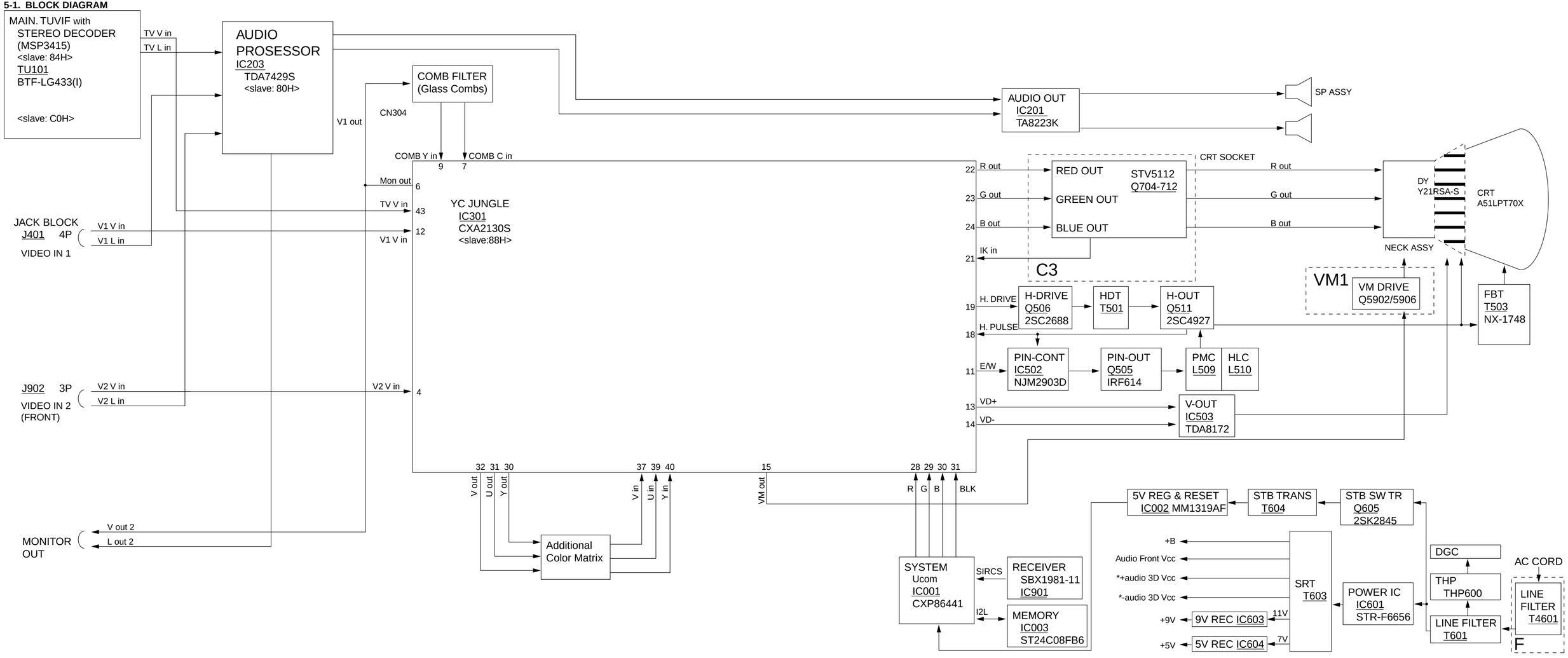
GEO 0B LCP (LOWER CORNER PIN)



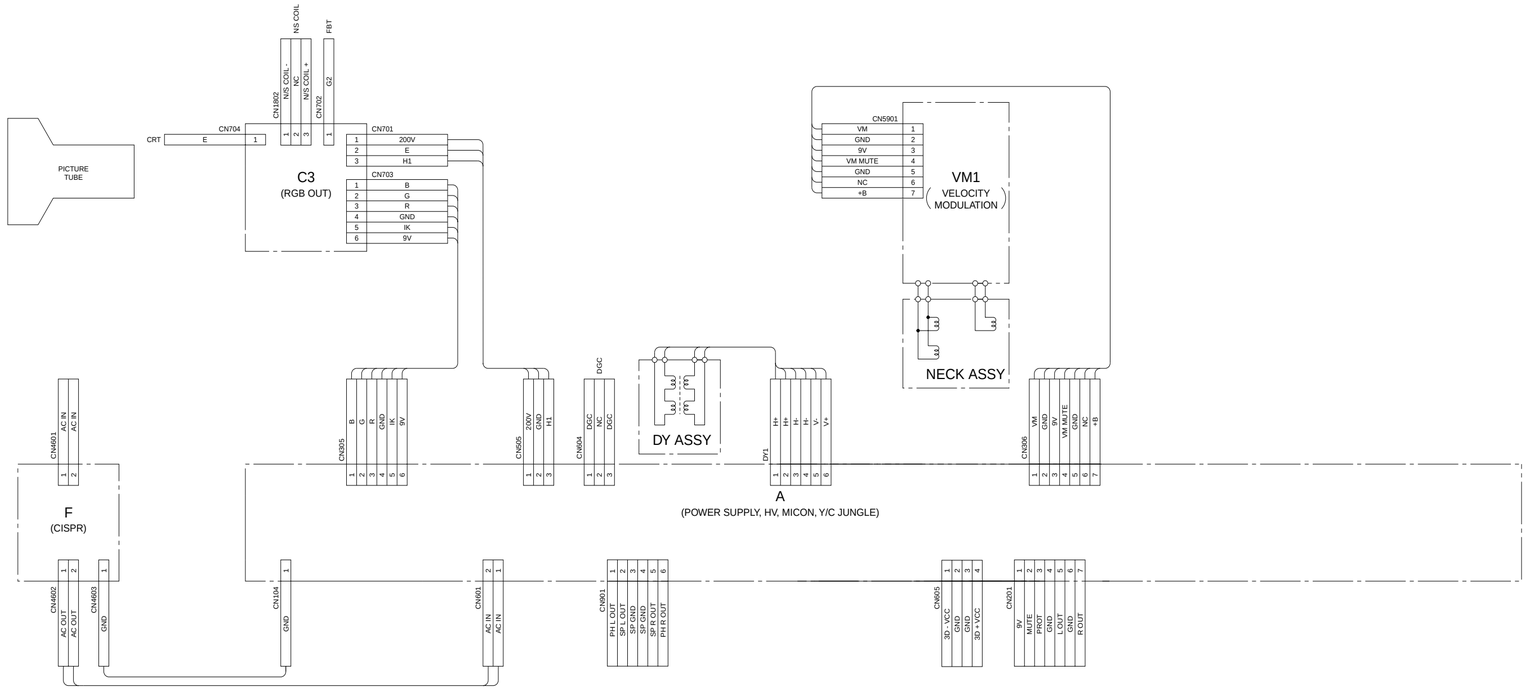
KV-2199M70
RM-952
KV-2199M70
RM-952

SECTION 5
DIAGRAM

5-1. BLOCK DIAGRAM

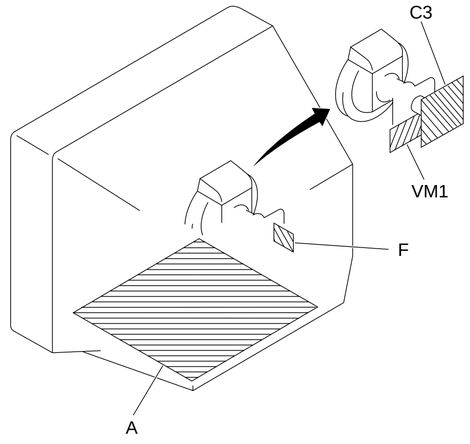


5-2. FRAME SCHEMATIC DIAGRAM



KV-2199M70
RM-952

5-3. CIRCUIT BOARDS LOCATION



KV-2199M70
RM-952

5-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note:

- All capacitors are in µF unless otherwise noted.
- All electrolytic capacitors are rated at 50V unless otherwise noted.
- All resistors are in ohms.
  kΩ = 1000Ω, MΩ = 1000kΩ
- Indication of resistance which does not have rating electrical power is as follows.

  Pitch: 5 mm
  Rating electrical power 1/4W (CHIP: 1/10W)

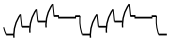
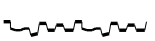
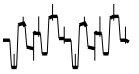
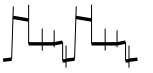
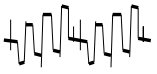
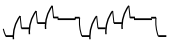
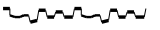
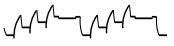
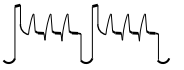
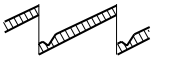
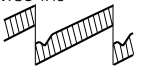
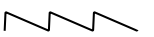
- : nonflammable resistor.
- △ : internal component.
- : panel designation or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B unless otherwise noted.
- **Readings are taken with a color-bar signal input.**
  no mark : PAL
  ( ) : SECAM
  [ ] : NTSC 3.58
  « » : NTSC 4.43
- **Readings are taken with a 10 MΩ digital multimeter.**
- **Voltage are dc with respect to ground unless otherwise noted.**
- **Voltage variations may be noted due to normal production tolerances.**
- **All voltages are in V.**
- *** : Cannot be measured.**
- **Circled numbers are waveform references.**
- **: B + bus.**
- **: B – bus.**
- ⇨ **: signal path.**

Reference information

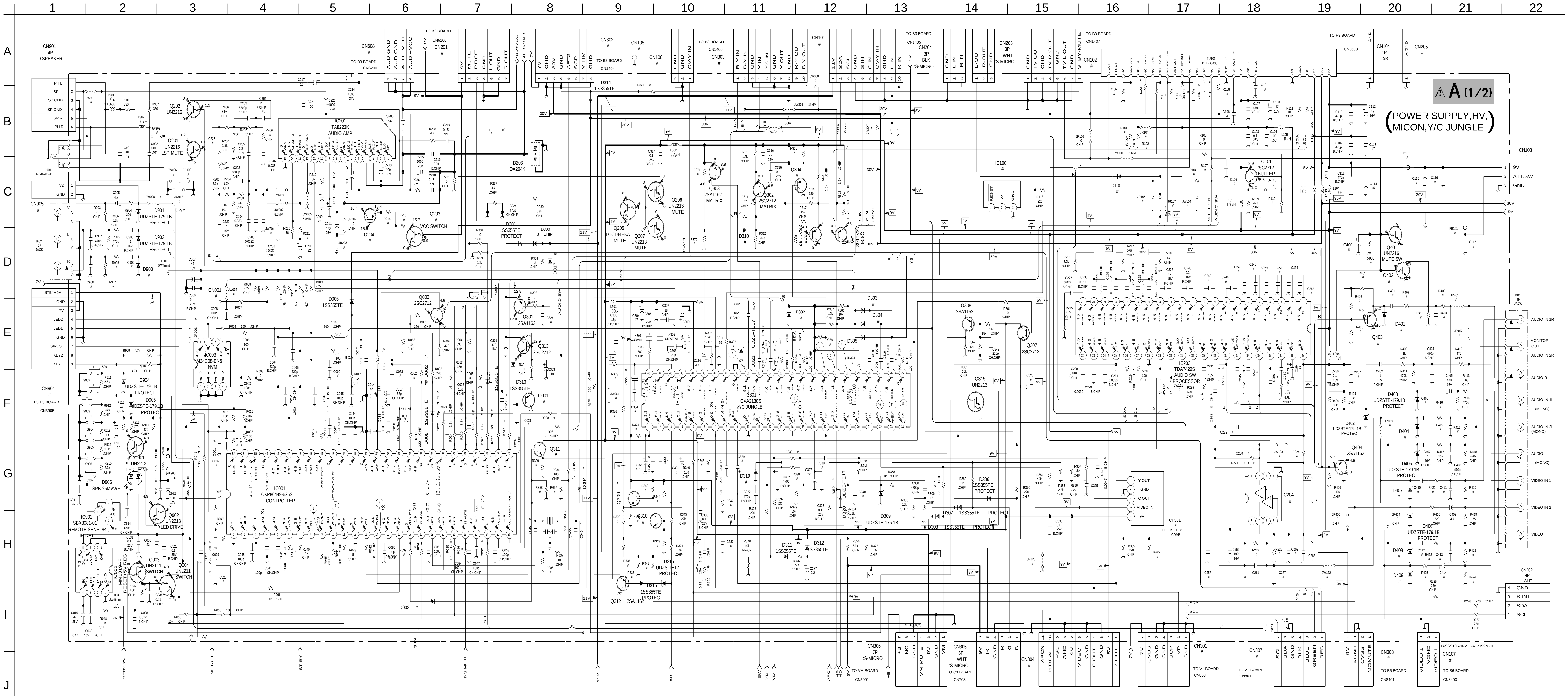
RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

Note: The component identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

A BOARD WAVEFORMS

① 4.5Vp-p (V)	② 3.8Vp-p (V)	③ 3.7Vp-p (V)	④ PAL 1.1Vp-p (H)	④ SECAM  1.3Vp-p (H)
④ NTSC 3.58  1.2Vp-p (H)	④ NTSC 4.43  0.8Vp-p (H)	⑤ PAL/NTSC 3.58 PAL : 0.9Vp-p (V) NTSC 3.58 : 0.6Vp-p (V)	⑤ SECAM/NTSC 4.43  1.0Vp-p (V)	⑥ 0.8Vp-p (H)
⑦ PAL  1.1Vp-p (H)	⑦ SECAM  1.0Vp-p (H)	⑦ NTSC 3.58  0.7Vp-p (H)	⑦ NTSC 4.43 1.2Vp-p (H)	⑧ PAL 1.1Vp-p (H)
⑧ SECAM  1.1Vp-p (H)	⑧ NTSC 0.8Vp-p (H)	⑨ 0.8Vp-p (H)	⑩ PAL/NTSC PAL : 2.7Vp-p (H) NTSC : 2.8Vp-p (H)	⑩ SECAM 0.8Vp-p (H)
⑪ 3.1Vp-p (H)	⑫ PAL/NTSC 3.58 3.0Vp-p (H)	⑫ SECAM  3.0Vp-p (H)	⑫ NTSC 4.43 3.1Vp-p (H)	⑬ PAL/SECAM/NTSC 3.58  1.0Vp-p (H)
⑬ NTSC 4.43  0.9Vp-p (H)	⑭ 125Vp-p	⑮ 920Vp-p	⑯  1.4Vp-p (V)	

(1) Schematic Diagram of A(1/2) Board

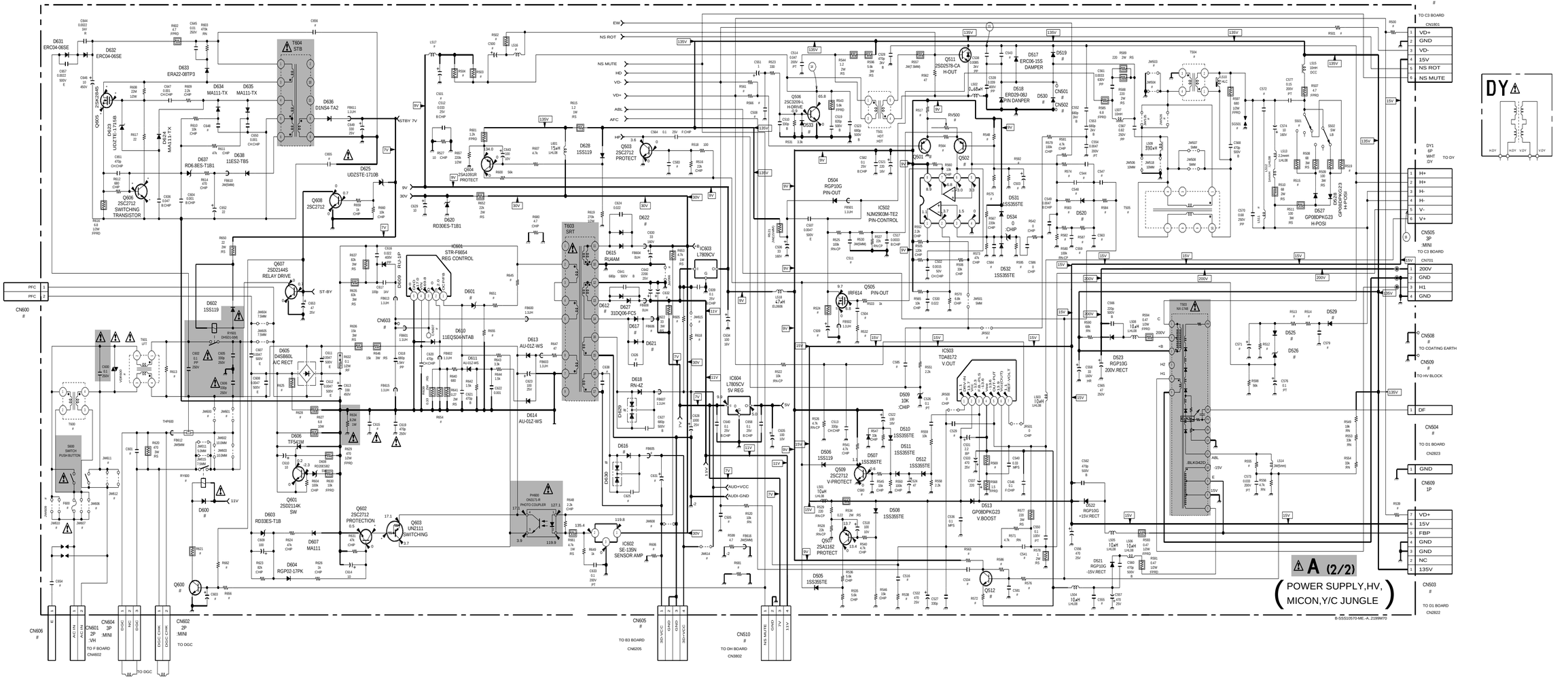


A (1/2)
(POWER SUPPLY,HV, MICON,Y/C JUNGLE)
CN901 4P TO SPEAKER
CN905
CN904 TO H3 BOARD CN3905
CN608 TO B3 BOARD CN6200
CN201 TO B3 BOARD CN6206
CN302 TO B3 BOARD CN1404
CN105
CN106
CN303 TO B3 BOARD CN1406
CN101
CN204 3P BLK :S-MICRO TO B3 BOARD CN1405
CN203 3P WHT :S-MICRO
CN102 TO B3 BOARD CN1407
TU101 BTF-LG433
CN3603 TO H3 BOARD
CN104 1P :TAB
CN205
CN103
CN202 4P WHT
IC201 TA8223K AUDIO AMP
IC100
IC003 M24C08-BN6 NVM
IC001 CXP86449-626S CONTROLLER
IC301 CXA2130S Y/C JUNGLE
IC203 TDA7429S AUDIO SW PROCESSOR
IC204
IC901 SBX3081-01 REMOTE SENSOR IR-DET
IC002 MM1319AF RESET+5V REG
Q101 2SC2712 BUFFER
Q201 UN2216 LSP-MUTE
Q202 UN2216
Q203 VCC SWITCH
Q204
Q205 DTC144EKA MUTE
Q206 UN2213 MUTE
Q207 UN2213 MUTE
Q301 2SA1162
Q302 2SC2712 MATRIX
Q303 2SA1162 MATRIX
Q304
Q305 2SA1162 SW
Q306 2SA1162 SW
Q307 2SC2712
Q308 2SA1162
Q309
Q310
Q311
Q312 2SA1162
Q313 2SC2712
Q315 UN2213
Q401 UN2216 MUTE SW
Q402
Q403
Q404 2SA1162
Q901 UN2213 LED DRIVE
Q902 UN2213 LED DRIVE
Q003 UN2111 SWITCH
Q004 UN2211 SWITCH
Q001
Q002 2SC2712
D203 DA204K
D901 UDZSTE-179.1B PROTECT
D902 UDZSTE-179.1B PROTECT
D904 UDZSTE-179.1B PROTECT
D905 UDZSTE-179.1B PROTECT
D906 SPB-26MVWF
D301 1SS355TE PROTECT
D313 1SS355TE
D314 1SS355TE
D006 1SS355TE
D306 1SS355TE PROTECT
D307 1SS355TE PROTECT
D308 1SS355TE PROTECT
D309 UDZSTE-175.1B
D311 1SS355TE
D312 1SS355TE
D315 1SS355TE PROTECT
D316 UDZS-TE17 PROTECT
D402 UDZSTE-179.1B PROTECT
D403 UDZSTE-179.1B PROTECT
D405 UDZSTE-179.1B PROTECT
D406 UDZSTE-179.1B PROTECT
CP301 FILTER BLOCK COMB
J401 4P JACK
AUDIO IN 1R
MONITOR OUT
AUDIO IN 2R
AUDIO R
AUDIO IN 1L (MONO)
AUDIO IN 2L (MONO)
AUDIO L (MONO)
VIDEO IN 1
VIDEO IN 2
VIDEO
CN306 7P :S-MICRO TO VM BOARD CN5901
CN305 6P WHT :S-MICRO TO C3 BOARD CN703
CN304
CN301 TO V1 BOARD CN803
CN307 TO V1 BOARD CN801
CN308 TO B6 BOARD CN8401
CN107 TO B6 BOARD CN8403
B-SSS10570-ME.-A..2199M70
STBY 7V
NS ROT
ST-BY
NS MUTE
11V
ABL

Schematic diagram ← A (1/2) board

Schematic diagram A (2/2) board →

(2) Schematic Diagram of A(2/2) Board


A (2/2)
(POWER SUPPLY,HV, MICON,Y/C JUNGLE)
B-SS3105570-ME-A_2199M70
DY
CN507
TO C3 BOARD
CN3801
VD+
GND
VD-
15V
NS ROT
NS MUTE
DY1
6P WHT
TO DY
H+
H+
H-
H-
V-
V+
CN505
3P
MINI
TO C3 BOARD
CN701
200V
GND
H1
GND
CN508
TO COATING EARTH
CN509
TO HV BLOCK
DF
CN504
TO D1 BOARD
CN2823
GND
CN609
1P
VD+
15V
FBP
GND
GND
NC
135V
CN503
TO D1 BOARD
CN2822
CN600
PFC
CN606
CN601
2P
VH
TO F BOARD
CN4602
CN604
3P
MINI
VH
CN602
2P
MINI
TO DGC
CN605
TO B3 BOARD
CN6205
CN510
TO DH BOARD
CN3802
EW
NS ROT
NS MUTE
HD
VD-
VD+
ABL
AFC
STBY 7V
ST-BY
AUDI+VCC
AUDI-GND
IC601 STR-F6654 REG CONTROL
IC602 SE-135N SENSOR AMP
IC603 L7809CV
IC604 L7805CV 5V REG
IC501 TDA8172 V.OUT
IC502 NJM2903M-TE2 PIN-CONTROL
IC503 TDA8172 V.OUT
Q501 2SC3209-L H-DRIVE
Q502 2SA1091R PROTECT
Q503 2SC2712 PROTECT
Q504 RGP10G PIN-OUT
Q505 IRF614 PIN-OUT
Q506 2SC3209-L H-DRIVE
Q507 2SA1162 PROTECT
Q508 2SC2712
Q509 2SC2712 V-PROTECT
Q510 2SC2712 PROTECTION
Q511 2SD2578-CA H-OUT
Q512
Q513 GP0BDPKG23 V.BOOST
Q600
Q601 2SD2114K SW
Q602 2SC2712 PROTECTION
Q603 UN2111 SWITCHING
Q604 2SC2712 SWITCHING TRANSISTOR
Q605 2SK2845
Q606 TF541M
Q607 2SD2144S RELAY DRIVE
D501 1SS355TE
D502 1SS355TE
D503 1SS355TE
D504 RGP10G PIN-OUT
D505 1SS355TE
D506 1SS119
D507 1SS355TE
D508 1SS355TE
D509 10K CHIP
D510 1SS355TE
D511 1SS355TE
D512 1SS355TE
D513 GP0BDPKG23 V.BOOST
D517 ERC06-15S DAMPER
D518 ERD29-08J PIN DAMPER
D519
D520
D521 RGP10G -15V RECT
D522 RGP10G +15V RECT
D523 RGP10G 200V RECT
D525
D526
D527 GP0BDPKG23 H-POSI
D529
D530
D531 1SS355TE
D532 1SS355TE
D533
D534 CHIP
D600
D601
D602 1SS119
D603 RD33ES-T1B
D604 RGP02-17PK
D605 D4SB60L A/C RECT
D606
D607 MA111
D609 RU-1P
D610 11EQS04-NTAB
D611 AU-01Z-WS
D612 31DQ06-FC5
D613 AU-01Z-WS
D614 AU-01Z-WS
D615 RU44AM
D616
D617
D618 RN-42
D620 RD30ES-T1B1
D621
D622
D625 UDZSTE-1710B
D626 D2NS4-TA2
D627 31DQ06-FC5
D628 1SS119
D630
D631 ERC04-06SE
D632 ERC04-06SE
D633 ERA22-08TP3
D634 MA111-TX
D635 MA111-TX
D636 D2NS4-TA2
D637 RD6.8ES-T1B1
D638 11ES2-TB5
D639 RU-1P
DZ501 RD33ES-T1B
DZ502 RD33ES-T1B
DZ503 RD33ES-T1B
DZ504 RD33ES-T1B
DZ505 RD33ES-T1B
DZ506 RD33ES-T1B
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DZ508 RD33ES-T1B
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DZ520 RD33ES-T1B
DZ521 RD33ES-T1B
DZ522 RD33ES-T1B
DZ523 RD33ES-T1B
DZ524 MA111-TX
PHOTO-COUPLER PH9220
S600 SWITCH PUSH BUTTON
T600 STB
T601 LPT
T602
T603 SRT
T604 STB
T605
T606
T607
T608
T609
T610
T611
T612
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T614
T615
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T617
T618
T619
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T621
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T623
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T629
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T631
T632
T633
T634
T635
T636
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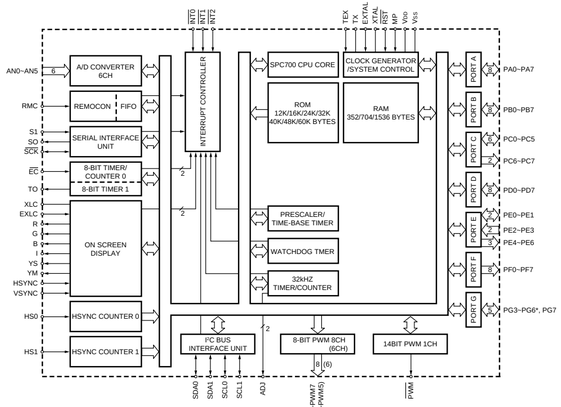
T641
T642
T643
T644

KV-2199M70
RM-952

A BOARD IC001 CXP86449-626S



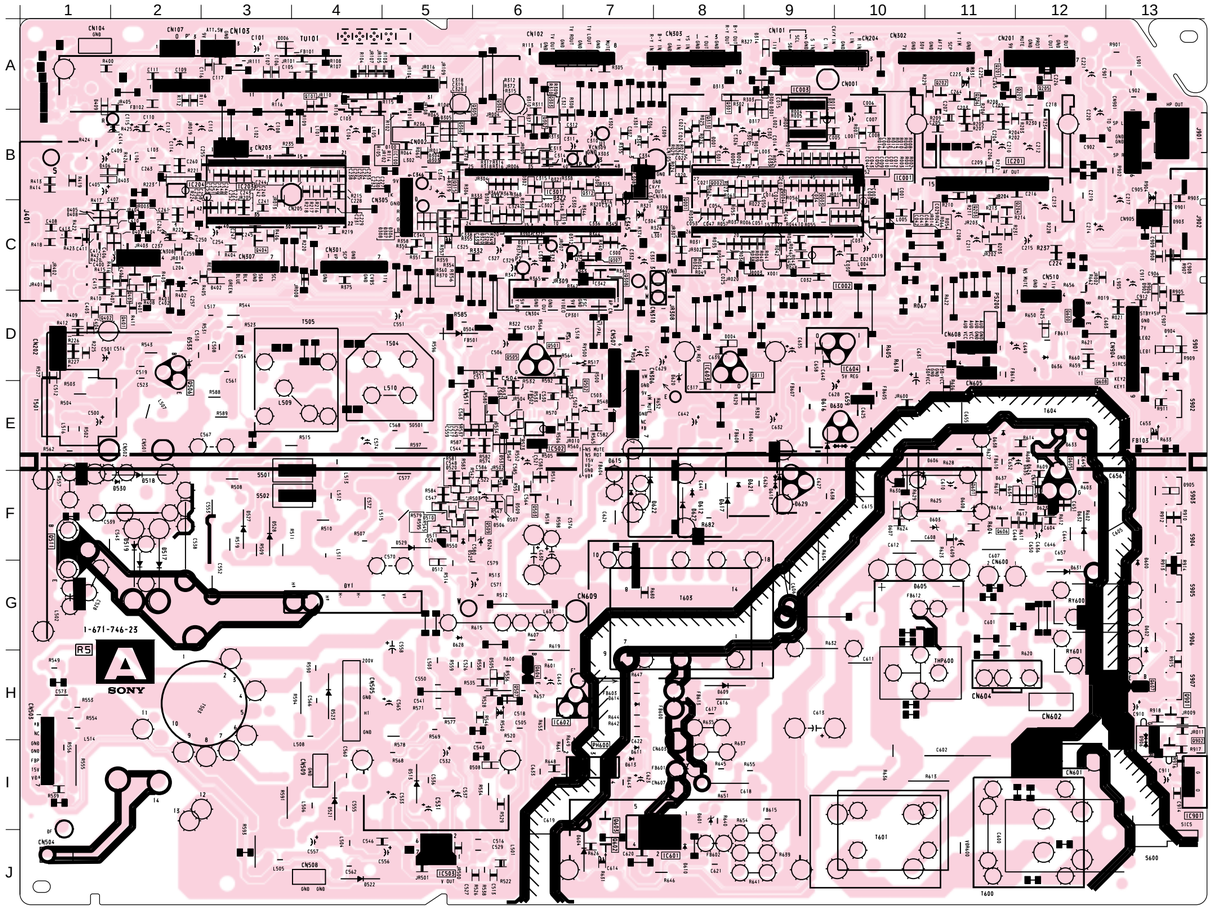
NOTE:
The circuit indicated at left contains high voltage of over 600 Vp-p. Please pay attention when inspecting or repairing it to prevent an electric shock.

A [SYSTEM CONTROLLER, Y/C JUNGLE, DEFLECTION, TUVIF, FRONT AMP, POWER SUPPLY]

A BOARD

PRINTED WIRING BOARD

– A Board –



IC

IC001	B-10
IC002	C-10
IC003	A-9
IC100	B-5
IC201	B-11
IC203	B-8
IC204	B-2
IC301	B-6
IC502	E-6
IC503	J-5
IC601	I-8
IC602	H-7
IC603	D-8
IC604	D-10
IC901	I-13
PH600	H-7

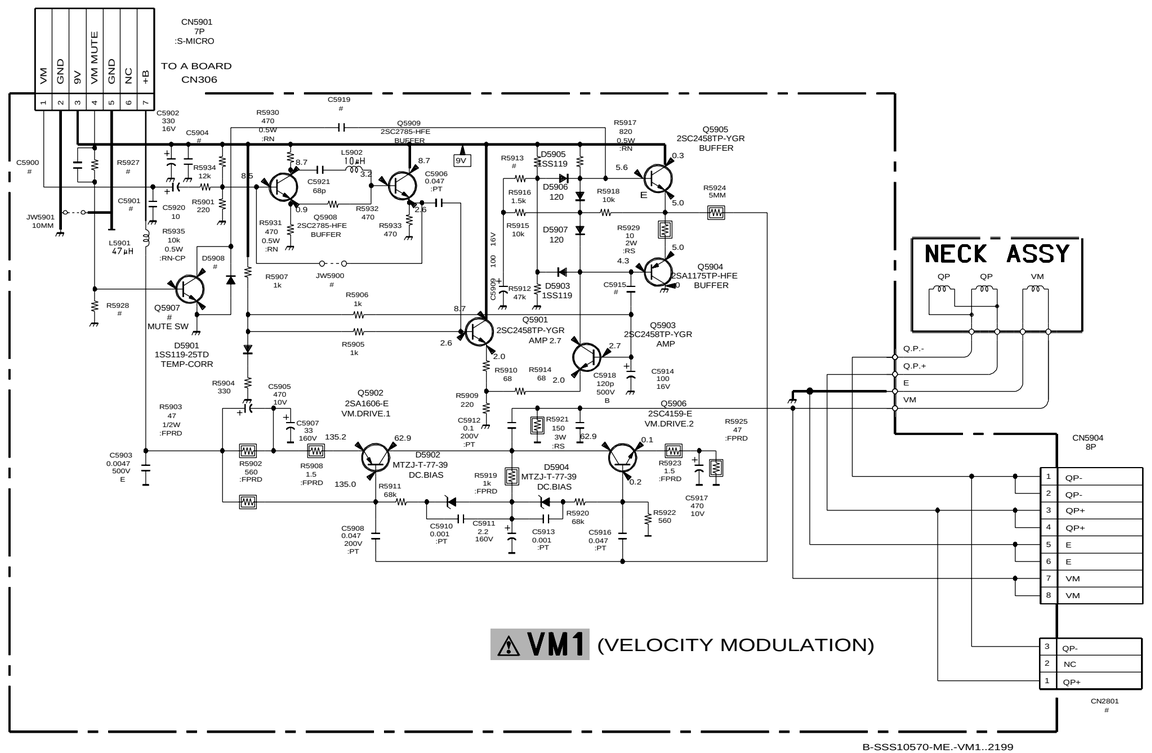
TRANSISTOR

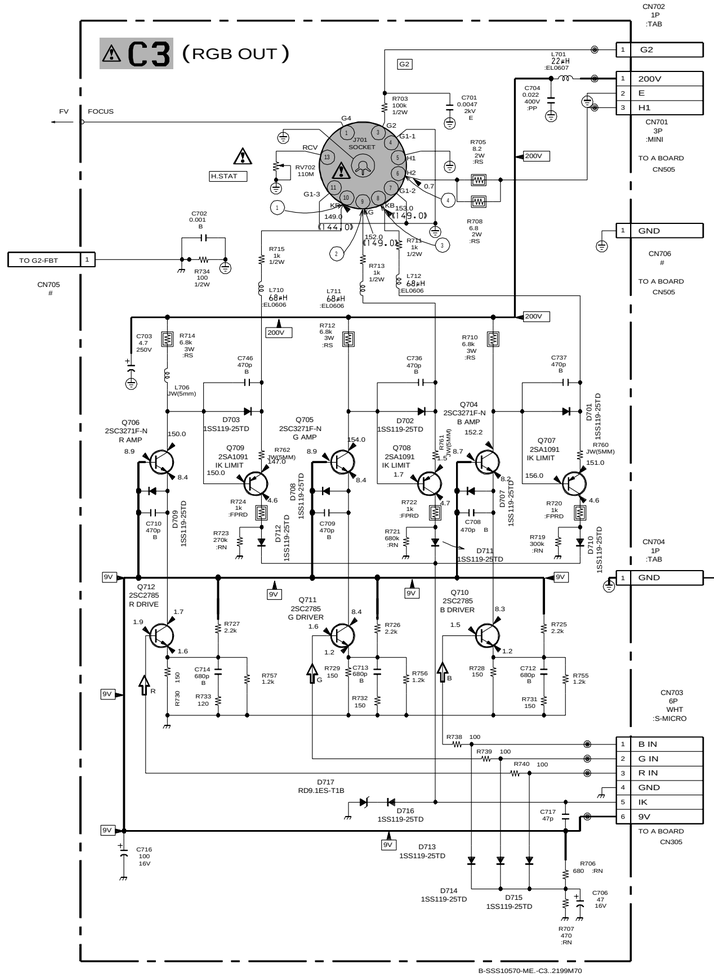
Q001	B-8
Q002	B-8
Q003	C-9
Q004	C-9
Q101	A-4
Q201	A-11
Q202	A-11
Q203	C-11
Q204	C-12
Q205	A-12
Q206	A-11
Q207	A-12
Q301	B-8
Q302	B-6
Q303	A-6
Q304	B-6
Q305	B-5
Q306	B-5
Q307	C-7
Q308	C-7
Q311	D-9
Q312	B-7
Q313	B-8
Q315	B-5
Q401	D-2
Q402	D-1
Q403	D-2
Q404	C-3
Q501	D-6
Q502	E-7
Q503	F-6
Q505	D-6
Q506	D-2
Q507	H-6
Q509	F-6
Q511	F-1
Q600	D-12
Q601	F-11
Q602	J-7
Q603	I-7
Q604	H-6
Q605	E-12
Q606	F-11
Q607	H-13
Q608	D-12
Q901	H-13
Q902	H-13

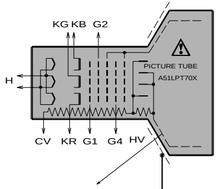
DIODE

D001	B-8
D002	B-8
D003	C-9
D004	D-8
D005	B-8
D006	A-3
D100	B-5
D203	C-11
D300	A-9
D301	B-9
D302	B-6
D303	B-5
D304	B-5
D305	B-5
D308	B-4
D309	B-6
D310	A-6
D311	C-6
D312	C-7
D313	A-8
D315	B-7
D316	C-7
D317	B-9
D314	A-9
D319	C-7
D320	C-6
D321	B-6
D322	B-6
D401	D-2
D402	C-3
D403	B-2
D405	C-1
D406	B-1
D407	C-2
D408	C-1
D409	A-1
D504	D-5
D505	H-6
D506	F-6
D507	F-6
D508	I-5
D509	F-6
D510	F-5
D511	F-5
D512	G-5
D513	I-5
D517	F-2
D518	F-2
D519	F-2
D520	E-5
D521	I-4
D522	J-4
D523	H-4
D525	F-5
D526	F-6
D527	F-3
D528	F-3
D529	F-5
D530	F-2
D531	E-6
D532	E-6
D533	D-2
D534	E-6
D600	G-13
D601	I-8
D602	G-13
D603	F-11
D604	J-7
D605	G-10
D606	E-11
D607	F-10
D608	F-11
D609	H-8
D610	J-8
D611	I-7
D612	F-8
D613	I-7
D614	H-7
D615	E-7
D616	E-9
D617	F-8
D618	F-9
D620	D-8
D621	F-9
D622	F-8
D623	F-12
D624	F-12
D625	D-12
D627	F-8
D628	G-5
D629	F-9
D630	E-10
D631	G-12
D632	F-12
D633	E-12
D634	F-11
D635	F-12
D636	D-12
D637	F-11
D638	E-11
D901	C-13
D902	D-13
D903	C-13
D904	D-13
D905	F-13
D906	I-13

Schematic diagrams
C3 VM1 boards ➡


CN5901
7P
:S-MICRO
TO A BOARD
CN306
VM
GND
9V
VM MUTE
GND
NC
+B
NECK ASSY
QP
QP
VM
Q.P.-
Q.P.+
E
VM
CN5904
8P
QP-
QP-
QP+
QP+
E
E
VM
VM
QP-
NC
QP+
CNZ801
#
VM1 (VELOCITY MODULATION)
B-SSS10570-ME.-VM1..2199


C3 (RGB OUT)
CN702
1P
:TAB
G2
200V
E
H1
CN701
3P
:MINI
TO A BOARD
CN505
GND
CN706
#
TO A BOARD
CN505
TO G2-FBT
CN705
#
CN704
1P
:TAB
GND
CN703
6P
WHT
:S-MICRO
B IN
G IN
R IN
GND
IK
9V
TO A BOARD
CN305
B-SSS10570-ME.-C3..2199M70


KG KB G2
PICTURE TUBE
A51LPT70X
CV KR G1 G4 HV
TO A BOARD FBT

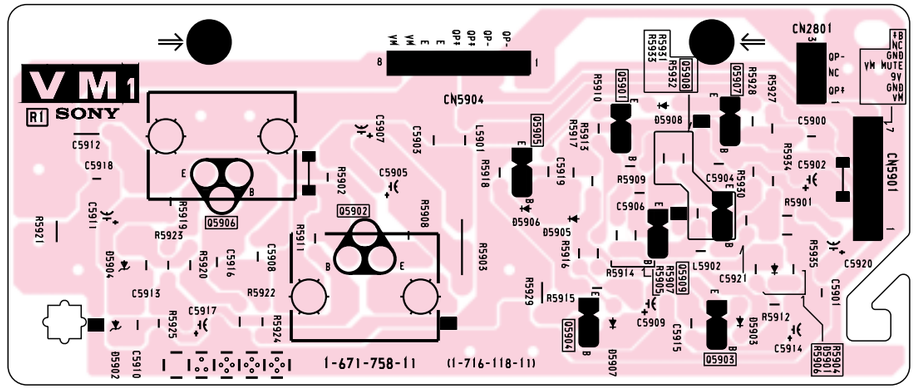
KV-2199M70
RM-952

VM1 [VELOCITY MODULATION]

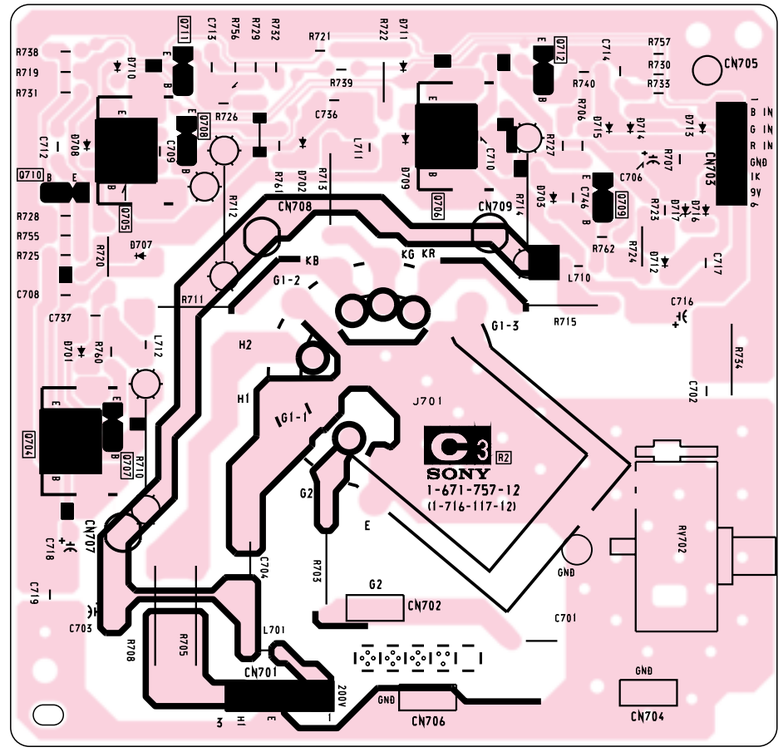
C3 [RGB OUT]

PRINTED WIRING BOARDS

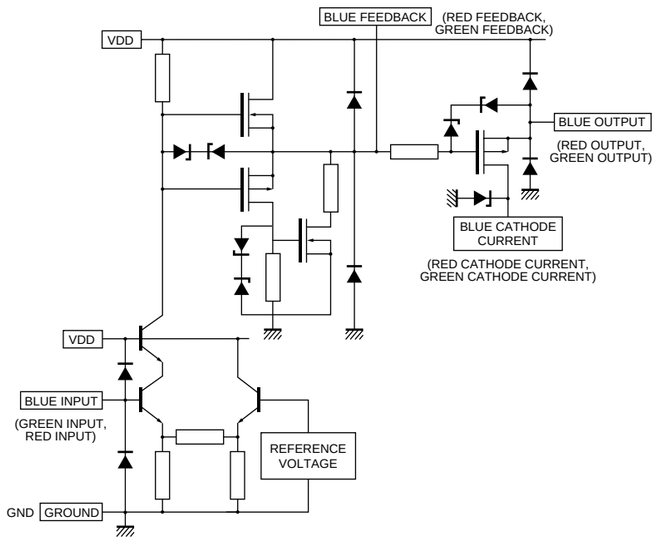
– VM1 Board –



– C3 Board –



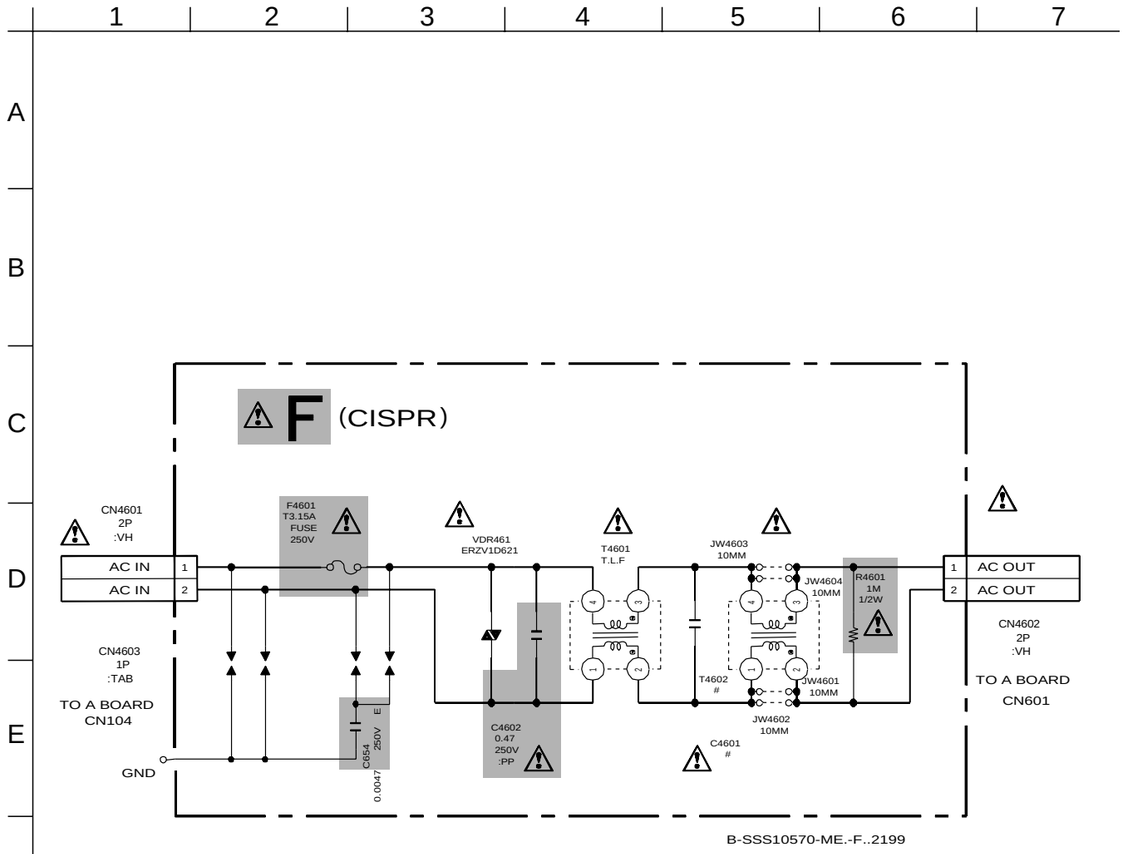
C3 BOARD IC701 STV5112



C3 BOARD WAVEFORMS

① 25Vp-p (H)	② PAL 89Vp-p (H)	② SECAM 90Vp-p (H)
② NTSC 3.58 80Vp-p (H)	② NTSC 4.43 93Vp-p (H)	③ PAL/SECAM : 95Vp-p (H) NTSC : 86Vp-p (H)
④ 75Vp-p (H)		

(4) Schematic Diagram of F Board

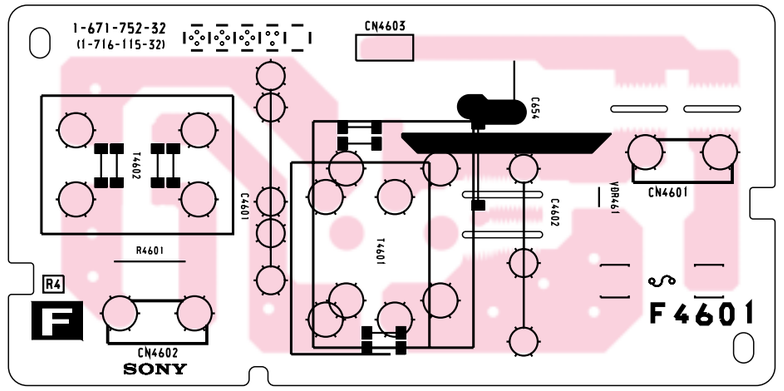


B-SSS10570-ME.-F..2199

F [CISPR]

PRINTED WIRING BOARDS

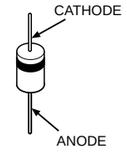
– F Board –



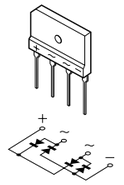
5-5. SEMICONDUCTORS

DIODE

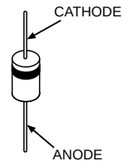
AU-01Z-V1
EL1Z
ERA22-08
GP08D
RD33EB3T
RGP02-17EL-6433



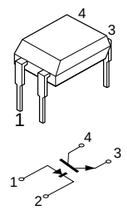
D3SB60



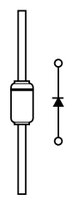
ERC04-06SE
RN4Z
RS3FS
RU4AM-T3
31DQO6-FC5



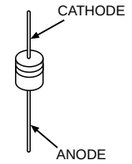
ON3171-R



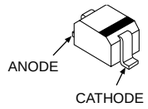
RD9.1ES-L2



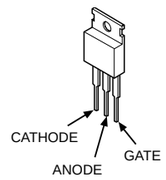
D1NS4
RD5.1ES-B3
RD6.8ES-B1
RD20ES-B2
RD30ESB2
RD39ES-B2
1SS119-25
11ES2
11EQS04



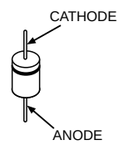
DTZ10B
DTZ-TT11-15B
UDZS-TE17-5.1B
UDZS-TE17-6.8B
UDZS-TE17-9.1B
MA111-(K8).S0
1SS355TE-17



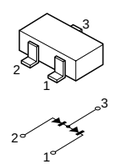
5P6M



ERD29-08J

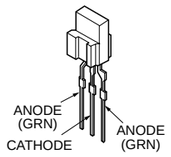


DA204K



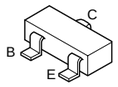
LED

SPB-26MVWF

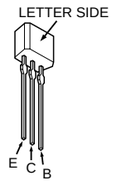


TRANSISTOR

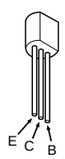
UN2111
UN2211
UN2213
UN2216
2SA1037AK-T146
2SA1162-G
2SC1623-L5L6
2SC2712-YG
2SD2114K
2SD601A-Q



2SA1175-HFE
2SA933AS-QT
2SC2785-HFE



2SA1091-0



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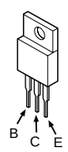

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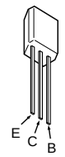

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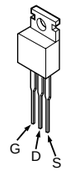

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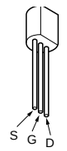

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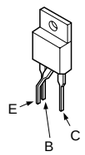

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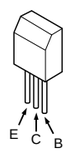

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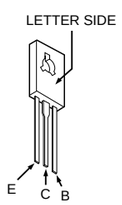

IC

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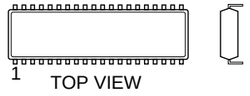
M24C08-BN6 (8PIN)
STV5112 (15PIN2)
TDA7429L
TDA7429S



Dual In-line Package
Pin 6—98

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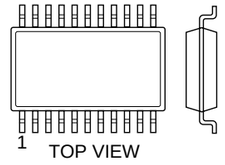

Single In -line Package
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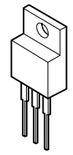
TA7805S



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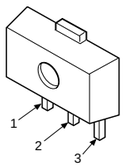

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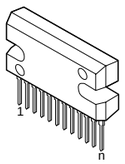
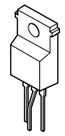


SE-135N



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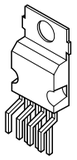
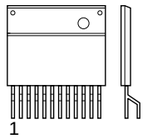


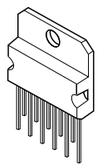
STR-F6654

MARKING SIDE VIEW



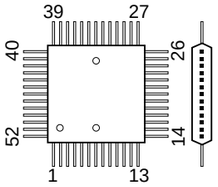
Zig-zag In -line Package
Pin 6—99

TDA2009A



RU-1P

MARKING SIDE VIEW



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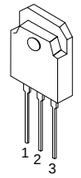
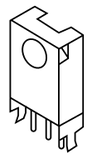


SBX3018-01 (30)



SECTION 7
ELECTRICAL PARTS LIST

A

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- All resistors are in ohms
- F : nonflammable

CAPACITORS
- MF : µF, PF : µµF

COILS
- MMH : mH, UH : µH

REF. NO.	PART NO.	DESCRIPTION			REMARK
	* A-1299-242-A	A BOARD COMPLETE			
		**********			
	* 4-055-304-01	HOLDER, LED			
	* 4-067-182-03	HOLDER, FBT			
	4-382-854-11	SCREW (M3X10), P, SW (+)			
	4-382-854-21	SCREW (M3X14), P, SW (+)			
	7-685-648-79	SCREW +BVTP	3X12 TYPE2 IT-3		
		<CAPACITOR>			
C003	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C004	1-163-001-11	CERAMIC CHIP	220PF	10.00% 50V	
C005	1-163-001-11	CERAMIC CHIP	220PF	10.00% 50V	
C006	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C007	1-104-664-11	ELECT	47UF	20.00% 16V	
C008	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C010	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C012	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C013	1-163-021-91	CERAMIC CHIP	0.01UF	10.00% 50V	
C014	1-104-664-11	ELECT	47UF	20.00% 25V	
C015	1-163-009-11	CERAMIC CHIP	0.001UF	10.00% 50V	
C016	1-163-113-00	CERAMIC CHIP	68PF	5.00% 50V	
C017	1-163-113-00	CERAMIC CHIP	68PF	5.00% 50V	
C019	1-104-664-11	ELECT	47UF	20.00% 25V	
C022	1-163-227-11	CERAMIC CHIP	10PF	0.50PF 50V	
C023	1-163-227-11	CERAMIC CHIP	10PF	0.50PF 50V	
C024	1-163-227-11	CERAMIC CHIP	10PF	0.50PF 50V	
C026	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C027	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C028	1-163-037-11	CERAMIC CHIP	0.022UF	10.00% 50V	
C030	1-126-965-11	ELECT	22UF	20.00% 50V	
C031	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C032	1-107-823-11	CERAMIC CHIP	0.47UF	10.00% 16V	
C034	1-163-031-11	CERAMIC CHIP	0.01UF	50V	
C041	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C042	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C043	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C044	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C047	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C048	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C050	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C051	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C053	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C054	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C055	1-163-251-11	CERAMIC CHIP	100PF	5.00% 50V	
C103	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C104	1-104-665-11	ELECT	100UF	20.00% 10V	
C107	1-163-005-11	CERAMIC CHIP	470PF	10.00% 50V	
C108	1-104-664-11	ELECT	47UF	20.00% 16V	
C109	1-163-005-11	CERAMIC CHIP	470PF	10.00% 50V	
C110	1-163-005-11	CERAMIC CHIP	470PF	10.00% 50V	
C111	1-163-005-11	CERAMIC CHIP	470PF	10.00% 50V	
C112	1-104-664-11	ELECT	47UF	20.00% 16V	
C113	1-104-664-11	ELECT	47UF	20.00% 25V	
C114	1-126-967-11	ELECT	47UF	20.00% 50V	
C202	1-163-020-00	CERAMIC CHIP	0.0082UF	10.00% 50V	
C203	1-163-020-00	CERAMIC CHIP	0.0082UF	10.00% 50V	
C204	1-136-159-00	MYLAR	0.033UF	5.00% 50V	
C205	1-164-161-11	CERAMIC CHIP	0.0022UF	10.00% 50V	
C206	1-164-161-11	CERAMIC CHIP	0.0022UF	10.00% 50V	
C207	1-136-159-00	MYLAR	0.033UF	5.00% 50V	
C208	1-126-965-11	ELECT	22UF	20.00% 50V	
C209	1-126-965-11	ELECT	22UF	20.00% 50V	
C210	1-126-933-11	ELECT	100UF	20.00% 16V	
C211	1-126-941-11	ELECT	470UF	20.00% 25V	
C212	1-126-933-11	ELECT	100UF	20.00% 16V	
C213	1-126-933-11	ELECT	100UF	20.00% 16V	
C214	1-126-942-61	ELECT	1000UF	20.00% 25V	
C215	1-126-942-61	ELECT	1000UF	20.00% 25V	
C216	1-163-021-91	CERAMIC CHIP	0.01UF	10.00% 50V	
C217	1-126-964-11	ELECT	10UF	20.00% 50V	
C218	1-136-167-00	MYLAR	0.15UF	5.00% 50V	
C219	1-136-167-00	MYLAR	0.15UF	5.00% 50V	
C220	1-126-942-61	ELECT	1000UF	20.00% 25V	
C221	1-126-964-11	ELECT	10UF	20.00% 50V	
C223	1-126-965-11	ELECT	22UF	20.00% 50V	
C224	1-163-133-00	CERAMIC CHIP	470PF	5.00% 50V	
C226	1-109-982-11	CERAMIC CHIP	1UF	10.00% 10V	
C227	1-163-037-11	CERAMIC CHIP	0.022UF	10.00% 50V	
C228	1-163-024-00	CERAMIC CHIP	0.018UF	10.00% 50V	
C229	1-163-018-00	CERAMIC CHIP	0.0056UF	10.00% 50V	
C230	1-163-024-00	CERAMIC CHIP	0.018UF	10.00% 50V	
C231	1-163-018-00	CERAMIC CHIP	0.0056UF	10.00% 50V	
C232	1-163-037-11	CERAMIC CHIP	0.022UF	10.00% 50V	
C233	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C234	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C235	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C236	1-164-004-11	CERAMIC CHIP	0.1UF	10.00% 25V	
C238	1-164-505-11	CERAMIC CHIP	2.2UF	16V	
C240	1-164-505-11	CERAMIC CHIP	2.2UF	16V	
C241	1-164-346-11	CERAMIC CHIP	1UF	16V	
C243	1-216-295-91	SHORT	0		
C245	1-164-346-11	CERAMIC CHIP	1UF	16V	
C252	1-164-346-11	CERAMIC CHIP	1UF	16V	
C254	1-126-965-11	ELECT	22UF	20.00% 50V	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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REF. NO.	PART NO.	DESCRIPTION			REMARK
C256	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C259	1-126-933-11	ELECT	100UF	20.00%	16V
C264	1-164-505-11	CERAMIC CHIP	2.2UF		16V
C265	1-164-505-11	CERAMIC CHIP	2.2UF		16V
C301	1-126-935-11	ELECT	470UF	20.00%	16V
C302	1-163-005-11	CERAMIC CHIP	470PF	10.00%	50V
C303	1-126-964-11	ELECT	10UF	20.00%	50V
C304	1-126-967-11	ELECT	47UF	20.00%	50V
C305	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C306	1-163-233-11	CERAMIC CHIP	18PF	5.00%	50V
C307	1-163-233-11	CERAMIC CHIP	18PF	5.00%	50V
C308	1-163-259-91	CERAMIC CHIP	220PF	5.00%	50V
C309	1-126-957-11	ELECT	0.22UF	20.00%	50V
C310	1-126-963-11	ELECT	4.7UF	20.00%	50V
C311	1-126-964-11	ELECT	10UF	20.00%	50V
C312	1-164-346-11	CERAMIC CHIP	1UF		16V
C313	1-164-346-11	CERAMIC CHIP	1UF		16V
C315	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C316	1-104-664-11	ELECT	47UF	20.00%	25V
C317	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C318	1-163-031-11	CERAMIC CHIP	0.01UF		50V
C319	1-163-031-11	CERAMIC CHIP	0.01UF		50V
C320	1-163-031-11	CERAMIC CHIP	0.01UF		50V
C322	1-163-005-11	CERAMIC CHIP	470PF	10.00%	50V
C324	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C325	1-126-960-11	ELECT	1UF	20.00%	50V
C327	1-126-965-11	ELECT	22UF	20.00%	50V
C328	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C330	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C332	1-126-963-11	ELECT	4.7UF	20.00%	50V
C335	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C336	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C337	1-126-961-11	ELECT	2.2UF	20.00%	50V
C338	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C341	1-115-340-11	CERAMIC CHIP	0.22UF	10.00%	25V
C342	1-163-259-91	CERAMIC CHIP	220PF	5.00%	50V
C402	1-164-346-11	CERAMIC CHIP	1UF		16V
C404	1-163-005-11	CERAMIC CHIP	470PF	10.00%	50V
C405	1-126-935-11	ELECT	470UF	20.00%	16V
C407	1-164-346-11	CERAMIC CHIP	1UF		16V
C408	1-163-133-00	CERAMIC CHIP	470PF	5.00%	50V
C409	1-126-963-11	ELECT	4.7UF	20.00%	50V
C502	1-163-145-00	CERAMIC CHIP	0.0015UF	5.00%	50V
C506	1-107-638-11	ELECT	33UF	20.00%	160V
C507	1-161-830-00	CERAMIC	0.0047UF		500V
C510	1-102-112-00	CERAMIC	330PF	10.00%	50V
C512	1-163-989-11	CERAMIC CHIP	0.033UF	10.00%	25V
C513	1-163-263-11	CERAMIC CHIP	330PF	5.00%	50V
C514	1-106-383-00	MYLAR	0.047UF	10.00%	200V
C517	1-164-182-11	CERAMIC CHIP	0.0033UF	10.00%	50V
C518	1-104-665-11	ELECT	100UF	20.00%	10V
C519	1-102-212-00	CERAMIC	820PF	10.00%	500V
C521	1-126-934-11	ELECT	220UF	20.00%	16V
C522	1-126-933-11	ELECT	100UF	20.00%	16V
C523	1-102-002-00	CERAMIC	680PF	10.00%	500V
C524	1-126-967-11	ELECT	47UF	20.00%	50V
C526	1-130-495-00	MYLAR	0.1UF	5.00%	50V
C527	1-102-820-00	CERAMIC	330PF	5.00%	50V
C528	1-162-134-11	CERAMIC	470PF	10.00%	2KV
C530	1-137-372-11	MYLAR	0.022UF	5.00%	50V
C531	1-126-961-11	ELECT	2.2UF	20.00%	50V
C532	1-126-941-11	ELECT	470UF	20.00%	25V
C533	1-126-941-11	ELECT	470UF	20.00%	25V
C536	1-136-165-00	MYLAR	0.1UF	5.00%	50V
C537	1-126-969-11	ELECT	220UF	20.00%	50V
C538	1-117-657-11	FILM	8500PF	3.00%	1.2KV
C539	1-129-746-91	FILM	0.039UF	5.00%	400V
C540	1-136-171-00	MYLAR	0.33UF	5.00%	50V
C546	1-165-319-11	CERAMIC CHIP	0.1UF		50V
C549	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C550	1-106-220-00	MYLAR	0.1UF	10.00%	100V
C551	1-126-960-11	ELECT	1UF	20.00%	50V
C552	1-162-116-00	CERAMIC	680PF	10.00%	2KV
C553	1-162-116-00	CERAMIC	680PF	10.00%	2KV
C554	1-137-417-11	MYLAR	0.0047UF	10.00%	200V
C556	1-126-941-11	ELECT	470UF	20.00%	25V
C557	1-126-941-11	ELECT	470UF	20.00%	25V
C558	1-123-024-21	ELECT	33UF		160V
C560	1-102-228-00	CERAMIC	470PF	10.00%	500V
C561	1-129-708-91	FILM	0.0033UF	5.00%	630V
C562	1-102-228-00	CERAMIC	470PF	10.00%	500V
C564	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C565	1-107-655-11	ELECT	47UF	20.00%	250V
C566	1-102-244-00	CERAMIC	220PF	10.00%	500V
C567	1-115-521-11	FILM	0.82UF	5.00%	250V
C568	1-102-228-00	CERAMIC	470PF	10.00%	500V
C570	1-115-520-11	FILM	0.68UF	5.00%	250V
C573	1-106-379-12	MYLAR	0.033UF	10.00%	200V
C574	1-107-649-11	ELECT	2.2UF	20.00%	250V
C576	1-130-495-00	MYLAR	0.1UF	5.00%	50V
C577	1-106-395-00	MYLAR	0.15UF	10.00%	200V
C582	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C586	1-216-295-91	SHORT	0		
C600 ⚠	1-104-705-11	MYLAR	0.1UF	20.00%	250V
C602 ⚠	1-104-705-11	MYLAR	0.1UF	20.00%	250V
C604	1-163-009-11	CERAMIC CHIP	0.001UF	10.00%	50V
C605 ⚠	1-127-942-51	CERAMIC	330PF	10%	250V
C606 ⚠	1-127-942-51	CERAMIC	330PF	10%	250V
C607	1-161-830-00	CERAMIC	0.0047UF	99%	500V
C608	1-161-830-00	CERAMIC	0.0047UF	99%	500V
C611	1-161-830-00	CERAMIC	0.0047UF	99%	500V
C612	1-161-830-00	CERAMIC	0.0047UF	99%	500V
C613	1-117-752-11	ELECT(BLOCK)	330UF	20.00%	450V
C616	1-130-202-00	FILM	0.022UF	10.00%	400V
C617	1-107-792-11	CERAMIC	100PF	5.00%	1KV
C618	1-125-893-11	FILM	680PF	3.00%	1.5KV
C619	1-119-886-51	CERAMIC	470PF	10.00%	250V
C620	1-163-133-00	CERAMIC CHIP	470PF	5.00%	50V
C621	1-102-114-00	CERAMIC	470PF	10.00%	50V
C622	1-102-074-00	CERAMIC	0.001UF	10.00%	50V
C623	1-104-665-11	ELECT	100UF	20.00%	25V
C624	1-104-331-11	CERAMIC	0.0022UF	10.00%	1KV
C627	1-102-002-00	CERAMIC	680PF	10.00%	500V
C628	1-126-942-61	ELECT	1000UF	20.00%	25V
C629	1-126-964-11	ELECT	10UF	20.00%	50V

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REF. NO.	PART NO.	DESCRIPTION			REMARK
C630	1-123-024-21	ELECT	33UF		160V
C633	1-104-999-11	MYLAR	0.1UF	10.00%	200V
C634	1-126-933-11	ELECT	100UF	20.00%	16V
C635	1-104-665-11	ELECT	100UF	20.00%	10V
C636	1-104-760-11	CERAMIC CHIP	0.047UF	10.00%	50V
C639	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C640	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C641	1-102-002-00	CERAMIC	680PF	10.00%	500V
C642	1-126-943-11	ELECT	2200UF	20.00%	25V
C643	1-104-665-11	ELECT	100UF	20.00%	10V
C644	1-104-331-11	CERAMIC	0.0022UF	10.00%	1KV
C645	1-137-605-11	MYLAR	0.01UF	10.00%	250V
C646	1-107-679-91	ELECT	10UF	20.00%	450V
C647	1-163-275-11	CERAMIC CHIP	0.001UF	5.00%	50V
C649	1-126-940-11	ELECT	330UF	20.00%	25V
C650	1-163-275-11	CERAMIC CHIP	0.001UF	5.00%	50V
C651	1-163-133-00	CERAMIC CHIP	470PF	5.00%	50V
C652	1-126-965-11	ELECT	22UF	20.00%	50V
C653	1-104-664-11	ELECT	47UF	20.00%	25V
C657	1-101-821-00	CERAMIC	0.0022UF		500V
C658	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C901	1-136-153-00	MYLAR	0.01UF	5.00%	50V
C902	1-136-153-00	MYLAR	0.01UF	5.00%	50V
C905	1-126-963-11	ELECT	4.7UF	20.00%	50V
C906	1-164-346-11	CERAMIC CHIP	1UF		16V
C907	1-163-133-00	CERAMIC CHIP	470PF	5.00%	50V
C910	1-126-967-11	ELECT	47UF	20.00%	50V
C911	1-126-967-11	ELECT	47UF	20.00%	50V
C912	1-164-004-11	CERAMIC CHIP	0.1UF	10.00%	25V
C913	1-104-665-11	ELECT	100UF	20.00%	10V
C914	1-163-133-00	CERAMIC CHIP	470PF	5.00%	50V
		<CONNECTOR>			
CN104	1-695-915-11	TAB (CONTACT)			
CN202 *	1-785-608-11	PIN, CONNECTOR 4P			
CN203 *	1-564-506-11	PLUG, CONNECTOR 3P			
CN204 *	1-564-506-11	PLUG, CONNECTOR 3P			
CN305 *	1-564-509-11	PLUG, CONNECTOR 6P			
CN306 *	1-564-510-11	PLUG, CONNECTOR 7P			
CN505	1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P			
CN506	4-352-844-01	PIN, LEAD, COATING			
CN601 *	1-580-843-11	PIN, CONNECTOR (POWER)			
CN602 *	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P			
CN604 *	1-573-963-11	PIN, CONNECTOR (PC BOARD) 3P			
CN609 *	1-508-784-21	PIN, CONNECTOR (5MM PITCH) 1P			
CN901 *	1-564-507-11	PLUG, CONNECTOR 4P			
		<DIODE>			
D001	8-719-988-61	DIODE 1SS355TE-17			
D005	8-719-988-61	DIODE 1SS355TE-17			
D006	8-719-988-61	DIODE 1SS355TE-17			
D203	8-719-914-42	DIODE DA204K-T-146			
D300	1-216-295-91	SHORT	0		
D301	8-719-988-61	DIODE 1SS355TE-17			
D306	8-719-988-61	DIODE 1SS355TE-17			
D307	8-719-988-61	DIODE 1SS355TE-17			

REF. NO.	PART NO.	DESCRIPTION			REMARK
D308	8-719-988-61	DIODE 1SS355TE-17			
D309	8-719-069-54	DIODE UDZS-TE17-5.1B			
D311	8-719-988-61	DIODE 1SS355TE-17			
D312	8-719-988-61	DIODE 1SS355TE-17			
D313	8-719-988-61	DIODE 1SS355TE-17			
D314	8-719-988-61	DIODE 1SS355TE-17			
D315	8-719-988-61	DIODE 1SS355TE-17			
D316	8-719-069-57	DIODE UDZS-TE17-6.8B			
D320	8-719-069-60	DIODE UDZS-TE17-9.1B			
D321	8-719-069-60	DIODE UDZS-TE17-9.1B			
D402	8-719-069-60	DIODE UDZS-TE17-9.1B			
D403	8-719-069-60	DIODE UDZS-TE17-9.1B			
D405	8-719-069-60	DIODE UDZS-TE17-9.1B			
D406	8-719-069-60	DIODE UDZS-TE17-9.1B			
D504	8-719-302-43	DIODE RGP10GPKG23			
D506	8-719-911-19	DIODE 1SS119-25TD			
D507	8-719-988-61	DIODE 1SS355TE-17			
D508	8-719-988-61	DIODE 1SS355TE-17			
D509	1-216-073-00	RES-CHIP	10K	5%	1/10W
D510	8-719-988-61	DIODE 1SS355TE-17			
D511	8-719-988-61	DIODE 1SS355TE-17			
D512	8-719-988-61	DIODE 1SS355TE-17			
D513	8-719-908-03	DIODE GP08DPKG23			
D517	8-719-945-80	DIODE ERC06-15S			
D518	8-719-900-26	DIODE ERD29-08J			
D521	8-719-302-43	DIODE RGP10GPKG23			
D522	8-719-302-43	DIODE RGP10GPKG23			
D523	8-719-302-43	DIODE RGP10GPKG23			
D527	8-719-908-03	DIODE GP08DPKG23			
D528	8-719-908-03	DIODE GP08DPKG23			
D531	8-719-988-61	DIODE 1SS355TE-17			
D532	8-719-988-61	DIODE 1SS355TE-17			
D534	1-216-295-91	SHORT	0		
D602	8-719-911-19	DIODE 1SS119-25TD			
D605	8-719-510-53	DIODE D4SB60L			
D609	8-719-311-31	DIODE RU-1P			
D610	8-719-210-21	DIODE 11EQS04-NTA1B			
D611	8-719-046-74	DIODE AU-01Z-V1			
D613	8-719-046-74	DIODE AU-01Z-V1			
D614	8-719-046-74	DIODE AU-01Z-V1			
D615	8-719-312-10	DIODE RU4AM-T3			
D618	8-719-067-18	DIODE RN4Z			
D620	8-719-110-72	DIODE RD30ES-T1B1			
D623	8-719-978-65	DIODE UDZ-TE-17-15B			
D624	8-719-073-01	DIODE MA111-TX			
D625	8-719-977-28	DIODE UDZS-TE17-10B			
D627	8-719-073-84	DIODE 31DQ06-FC5			
D628	8-719-911-19	DIODE 1SS119-25TD			
D631	8-719-068-00	DIODE ERC04-06SE			
D632	8-719-068-00	DIODE ERC04-06SE			
D633	8-719-948-45	DIODE ERA22-08TP3			
D634	8-719-073-01	DIODE MA111-TX			
D635	8-719-073-01	DIODE MA111-TX			
D636	8-719-510-02	DIODE D1NS4-TA2			
D637	8-719-109-96	DIODE RD6.8ES-T1B1			
D638	8-719-200-82	DIODE 11ES2-TB5			
D901	8-719-069-60	DIODE UDZS-TE17-9.1B			

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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REF. NO.		PART NO.	DESCRIPTION		REMARK
D902		8-719-069-60	DIODE UDZS-TE17-9.1B		
D904		8-719-069-60	DIODE UDZS-TE17-9.1B		
D905		8-719-069-60	DIODE UDZS-TE17-9.1B		
D906		8-719-045-19	DIODE SPB-26MVWF		
			<CONNECTOR>		
DY1	*	1-580-798-11	CONNECTOR PIN (DY) 6P		
			<FERRITE BEAD>		
FB501		1-410-397-21	FERRITE	1.1UH	
FB502		1-410-397-21	FERRITE	1.1UH	
FB600		1-410-397-21	FERRITE	1.1UH	
FB601		1-410-397-21	FERRITE	1.1UH	
FB602		1-410-397-21	FERRITE	1.1UH	
FB603		1-410-397-21	FERRITE	1.1UH	
FB604		1-412-911-31	FERRITE	0UH	
FB607		1-410-397-21	FERRITE	1.1UH	
FB608		1-412-911-31	FERRITE	0UH	
FB611		1-410-397-21	FERRITE	1.1UH	
FB613		1-410-397-21	FERRITE	1.1UH	
FB615		1-410-397-21	FERRITE	1.1UH	
			<IC>		
IC001		8-752-909-63	IC CXP86449-626S		
IC002		8-759-371-21	IC MM1319AFBE		
IC003		8-759-672-78	IC M24C08-BN6		
IC201		8-759-336-30	IC TA8223K		
IC203		8-759-642-61	IC TDA7429L		
IC301		8-752-090-41	IC CXA2139S		
IC502		8-759-700-07	IC NJM2903M-TE2		
IC503		8-759-980-58	IC TDA8172		
IC601		8-749-013-75	IC STR-F6654		
IC602		8-749-920-61	IC SE-135N		
IC603		8-759-701-59	IC L7809CV		
IC604		8-759-231-53	IC L7805CV		
IC901		8-759-180-30	HYB IC SBX3081-51(30)		
			<JACK>		
J401		1-779-849-11	JACK BLOCK, PIN 4P		
J901		1-770-786-21	JACK		
J902		1-779-205-11	JACK, PIN 2P		
			<CHIP CONDUCTOR>		
JR001		1-216-295-91	SHORT	0	
JR002		1-216-295-91	SHORT	0	
JR003		1-216-295-91	SHORT	0	
JR004		1-216-295-91	SHORT	0	
JR005		1-216-295-91	SHORT	0	
JR006		1-216-295-91	SHORT	0	
JR007		1-216-295-91	SHORT	0	
JR008		1-216-295-91	SHORT	0	
JR009		1-216-295-91	SHORT	0	
JR010		1-216-295-91	SHORT	0	
JR011		1-216-295-91	SHORT	0	
JR012		1-216-295-91	SHORT	0	
JR013		1-216-295-91	SHORT	0	
JR014		1-216-295-91	SHORT	0	
JR015		1-216-295-91	SHORT	0	
JR016		1-216-295-91	SHORT	0	
JR018		1-216-295-91	SHORT	0	
JR019		1-216-295-91	SHORT	0	
JR102		1-216-295-91	SHORT	0	
JR109		1-216-295-91	SHORT	0	
JR202		1-216-295-91	SHORT	0	
JR204		1-216-295-91	SHORT	0	
JR309		1-216-295-91	SHORT	0	
JR404		1-216-295-91	SHORT	0	
JR405		1-216-295-91	SHORT	0	
JR500		1-216-295-91	SHORT	0	
JR501		1-216-295-91	SHORT	0	
JR503		1-216-295-91	SHORT	0	
JR600		1-216-295-91	SHORT	0	
			<COIL>		
L002		1-414-856-11	INDUCTOR	10UH	
L003		1-414-180-11	INDUCTOR	3.3UH	
L005		1-414-233-22	INDUCTOR CHIP	0UH	
L101		1-414-856-11	INDUCTOR	10UH	
L102		1-414-856-11	INDUCTOR	10UH	
L103		1-414-856-11	INDUCTOR	10UH	
L104		1-414-856-11	INDUCTOR	10UH	
L105		1-414-856-11	INDUCTOR	10UH	
L204		1-414-856-11	INDUCTOR	10UH	
L301		1-414-189-31	INDUCTOR	100UH	
L302		1-414-185-41	INDUCTOR	22UH	
L501		1-412-525-31	INDUCTOR	10UH	
L502		1-422-613-11	COIL, AIR CORE		
L503		1-412-525-31	INDUCTOR	10UH	
L504		1-412-525-31	INDUCTOR	10UH	
L505		1-412-525-31	INDUCTOR	10UH	
L506		1-412-525-31	INDUCTOR	10UH	
L507		1-459-111-00	INDUCTOR	10MH	
L509		1-459-390-00	INDUCTOR	390UH	
L510		1-416-972-11	COIL, HORIZONTAL LINEARITY		
L513		1-412-552-11	INDUCTOR	2.2MH	
L515		1-459-104-00	COIL, WITH CORE		
L518		1-414-187-11	INDUCTOR	47UH	
L601		1-412-527-11	INDUCTOR	15UH	
L901		1-408-603-31	INDUCTOR	10UH	
L902		1-408-603-31	INDUCTOR	10UH	
L905		1-414-856-11	INDUCTOR	10UH	
			<PHOTO COUPLER>		
PH600	⚠	8-749-924-35	PHOTO COUPLER ON3171-R		
			<IC LINK>		
PS200		1-532-675-21	LINK, IC 1.5A/150V		

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REF. NO.	PART NO.	DESCRIPTION			REMARK
		<TRANSISTOR>			
Q002	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q003	8-729-424-08	TRANSISTOR UN2111-TX			
Q004	8-729-421-22	TRANSISTOR UN2211-TX			
Q101	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q201	8-729-424-67	TRANSISTOR UN2216-TX			
Q202	8-729-424-67	TRANSISTOR UN2216-TX			
Q205	8-729-421-19	TRANSISTOR UN2213-TX			
Q206	8-729-421-19	TRANSISTOR UN2213-TX			
Q207	8-729-421-19	TRANSISTOR UN2213-TX			
Q301	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q302	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q303	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q305	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q306	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q307	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q308	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q312	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q313	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q315	8-729-421-19	TRANSISTOR UN2213-TX			
Q401	8-729-424-67	TRANSISTOR UN2216-TX			
Q404	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q503	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q505	8-729-931-45	TRANSISTOR IRF614-LF			
Q506	8-729-119-80	TRANSISTOR 2SC2688-LK			
Q507	8-729-216-22	TRANSISTOR 2SA1162-YG-TE85L			
Q509	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q511	8-729-048-07	TRANSISTOR 2SD2578-CA			
Q604	8-729-200-17	TRANSISTOR 2SA1091R-TPE2			
Q605	8-729-044-30	TRANSISTOR 2SK2845-LB102			
Q606	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q607	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW			
Q608	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
Q901	8-729-421-19	TRANSISTOR UN2213-TX			
Q902	8-729-421-19	TRANSISTOR UN2213-TX			
		<RESISTOR>			
R001	1-414-233-22	INDUCTOR CHIP	0UH		
R002	1-216-025-91	RES-CHIP	100	5%	1/10W
R003	1-216-295-91	SHORT	0		
R004	1-216-025-91	RES-CHIP	100	5%	1/10W
R005	1-216-025-91	RES-CHIP	100	5%	1/10W
R007	1-216-295-91	SHORT	0		
R008	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R010	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R011	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R012	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R013	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R014	1-216-025-91	RES-CHIP	100	5%	1/10W
R015	1-216-025-91	RES-CHIP	100	5%	1/10W
R017	1-216-049-91	RES-CHIP	1K	5%	1/10W
R018	1-216-033-00	RES-CHIP	220	5%	1/10W
R019	1-216-073-00	RES-CHIP	10K	5%	1/10W
R021	1-216-073-00	RES-CHIP	10K	5%	1/10W
R022	1-216-033-00	RES-CHIP	220	5%	1/10W
R024	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R025	1-216-057-00	RES-CHIP	2.2K	5%	1/10W

REF. NO.	PART NO.	DESCRIPTION			REMARK
R026	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R027	1-216-073-00	RES-CHIP	10K	5%	1/10W
R029	1-216-049-91	RES-CHIP	1K	5%	1/10W
R031	1-216-049-91	RES-CHIP	1K	5%	1/10W
R035	1-216-025-91	RES-CHIP	100	5%	1/10W
R036	1-216-025-91	RES-CHIP	100	5%	1/10W
R037	1-216-025-91	RES-CHIP	100	5%	1/10W
R040	1-216-025-91	RES-CHIP	100	5%	1/10W
R041	1-216-025-91	RES-CHIP	100	5%	1/10W
R042	1-216-295-91	SHORT	0		
R043	1-216-049-91	RES-CHIP	1K	5%	1/10W
R044	1-216-025-91	RES-CHIP	100	5%	1/10W
R045	1-414-233-22	INDUCTOR CHIP	0UH		
R046	1-216-049-91	RES-CHIP	1K	5%	1/10W
R047	1-414-233-22	INDUCTOR CHIP	0UH		
R048	1-216-073-00	RES-CHIP	10K	5%	1/10W
R050	1-216-073-00	RES-CHIP	10K	5%	1/10W
R053	1-216-049-91	RES-CHIP	1K	5%	1/10W
R055	1-216-073-00	RES-CHIP	10K	5%	1/10W
R056	1-216-073-00	RES-CHIP	10K	5%	1/10W
R061	1-216-033-00	RES-CHIP	220	5%	1/10W
R062	1-216-041-00	RES-CHIP	470	5%	1/10W
R063	1-216-037-00	RES-CHIP	330	5%	1/10W
R064	1-216-037-00	RES-CHIP	330	5%	1/10W
R065	1-216-037-00	RES-CHIP	330	5%	1/10W
R066	1-216-049-91	RES-CHIP	1K	5%	1/10W
R067	1-216-049-91	RES-CHIP	1K	5%	1/10W
R105	1-216-295-91	SHORT	0		
R109	1-216-041-00	RES-CHIP	470	5%	1/10W
R111	1-216-025-91	RES-CHIP	100	5%	1/10W
R112	1-216-025-91	RES-CHIP	100	5%	1/10W
R113	1-216-047-91	RES-CHIP	820	5%	1/10W
R202	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R203	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R204	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R205	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R206	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R207	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R208	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R209	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R210	1-216-019-00	RES-CHIP	56	5%	1/10W
R212	1-216-019-00	RES-CHIP	56	5%	1/10W
R215	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R216	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R217	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R218	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R219	1-216-025-91	RES-CHIP	100	5%	1/10W
R220	1-216-025-91	RES-CHIP	100	5%	1/10W
R221	1-216-295-91	SHORT	0		
R225	1-216-033-00	RES-CHIP	220	5%	1/10W
R226	1-216-033-00	RES-CHIP	220	5%	1/10W
R227	1-216-033-00	RES-CHIP	220	5%	1/10W
R228	1-249-389-11	CARBON	4.7	5%	1/4W
R229	1-216-073-00	RES-CHIP	10K	5%	1/10W
R230	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R231	1-216-295-91	SHORT	0		
R234	1-249-389-11	CARBON	4.7	5%	1/4W
R235	1-216-069-00	RES-CHIP	6.8K	5%	1/10W

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REF. NO.	PART NO.	DESCRIPTION			REMARK
R236	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R237	1-216-308-00	RES-CHIP	4.7	5%	1/10W
R301	1-216-073-00	RES-CHIP	10K	5%	1/10W
R302	1-216-295-91	SHORT	0		
R303	1-216-049-91	RES-CHIP	1K	5%	1/10W
R304	1-216-073-00	RES-CHIP	10K	5%	1/10W
R305	1-216-051-00	RES-CHIP	1.2K	5%	1/10W
R306	1-216-077-91	RES-CHIP	15K	5%	1/10W
R308	1-216-025-91	RES-CHIP	100	5%	1/10W
R309	1-216-025-91	RES-CHIP	100	5%	1/10W
R310	1-216-025-91	RES-CHIP	100	5%	1/10W
R311	1-216-017-91	RES-CHIP	47	5%	1/10W
R312	1-216-041-00	RES-CHIP	470	5%	1/10W
R313	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R314	1-216-045-00	RES-CHIP	680	5%	1/10W
R316	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R317	1-216-077-91	RES-CHIP	15K	5%	1/10W
R318	1-216-051-00	RES-CHIP	1.2K	5%	1/10W
R319	1-216-025-91	RES-CHIP	100	5%	1/10W
R320	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R321	1-216-073-00	RES-CHIP	10K	5%	1/10W
R322	1-216-033-00	RES-CHIP	220	5%	1/10W
R331	1-216-295-91	SHORT	0		
R332	1-216-033-00	RES-CHIP	220	5%	1/10W
R333	1-216-073-00	RES-CHIP	10K	5%	1/10W
R334	1-216-129-00	RES-CHIP	2.2M	5%	1/10W
R335	1-216-045-00	RES-CHIP	680	5%	1/10W
R338	1-216-033-00	RES-CHIP	220	5%	1/10W
R340	1-216-025-91	RES-CHIP	100	5%	1/10W
R345	1-216-081-00	RES-CHIP	22K	5%	1/10W
R348	1-208-806-11	METAL CHIP	10K	0.5%	1/10W
R349	1-216-073-00	RES-CHIP	10K	5%	1/10W
R350	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R351	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R354	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R355	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R356	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R357	1-216-079-00	RES-CHIP	18K	5%	1/10W
R358	1-216-049-91	RES-CHIP	1K	5%	1/10W
R359	1-216-033-00	RES-CHIP	220	5%	1/10W
R360	1-216-033-00	RES-CHIP	220	5%	1/10W
R361	1-216-073-00	RES-CHIP	10K	5%	1/10W
R362	1-216-075-00	RES-CHIP	12K	5%	1/10W
R363	1-216-079-00	RES-CHIP	18K	5%	1/10W
R364	1-216-295-91	SHORT	0		
R365	1-216-033-00	RES-CHIP	220	5%	1/10W
R366	1-216-073-00	RES-CHIP	10K	5%	1/10W
R367	1-216-073-00	RES-CHIP	10K	5%	1/10W
R370	1-216-033-00	RES-CHIP	220	5%	1/10W
R376	1-216-081-00	RES-CHIP	22K	5%	1/10W
R377	1-216-121-91	RES-CHIP	1M	5%	1/10W
R378	1-216-031-00	RES-CHIP	180	5%	1/10W
R404	1-216-073-00	RES-CHIP	10K	5%	1/10W
R405	1-216-049-91	RES-CHIP	1K	5%	1/10W
R406	1-216-073-00	RES-CHIP	10K	5%	1/10W
R408	1-216-049-91	RES-CHIP	1K	5%	1/10W
R411	1-216-113-00	RES-CHIP	470K	5%	1/10W

REF. NO.	PART NO.	DESCRIPTION			REMARK
R412	1-216-041-00	RES-CHIP	470	5%	1/10W
R413	1-216-021-00	RES-CHIP	68	5%	1/10W
R414	1-216-113-00	RES-CHIP	470K	5%	1/10W
R417	1-216-077-91	RES-CHIP	15K	5%	1/10W
R418	1-216-113-00	RES-CHIP	470K	5%	1/10W
R419	1-216-022-00	RES-CHIP	75	5%	1/10W
R426	1-216-033-00	RES-CHIP	220	5%	1/10W
R505	1-216-099-00	RES-CHIP	120K	5%	1/10W
R506	1-216-085-00	RES-CHIP	33K	5%	1/10W
R507	1-249-389-11	CARBON	4.7	5%	1/4W
R508	1-215-910-00	METAL OXIDE	68	5%	3W
R509	1-215-911-11	METAL OXIDE	100	5%	3W
R510	1-215-886-11	METAL OXIDE	100	5%	2W
R511	1-215-911-11	METAL OXIDE	100	5%	3W
R516	1-216-081-00	RES-CHIP	22K	5%	1/10W
R518	1-247-807-31	CARBON	100	5%	1/4W
R520	1-215-445-00	METAL	10K	1%	1/4W
R522	1-208-806-11	METAL CHIP	10K	0.5%	1/10W
R523	1-249-411-11	CARBON	330	5%	1/4W
R525	1-208-830-11	METAL CHIP	100K	0.5%	1/10W
R526	1-208-798-11	METAL CHIP	4.7K	0.5%	1/10W
R527	1-216-001-00	RES-CHIP	10	5%	1/10W
R528	1-208-814-91	METAL CHIP	22K	0.5%	1/10W
R529	1-216-635-11	METAL CHIP	220	0.5%	1/10W
R531	1-247-843-11	CARBON	3.3K	5%	1/4W
R533	1-249-417-11	CARBON	1K	5%	1/4W
R534	1-216-361-00	METAL OXIDE	0.22	5%	2W
R535	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R536	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R537	1-208-814-91	METAL CHIP	22K	0.5%	1/10W
R540	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R541	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R542	1-216-295-91	SHORT	0		
R543	1-249-426-11	CARBON	5.6K	5%	1/4W
R544	1-216-457-00	METAL OXIDE	1.2K	5%	2W
R545	1-216-077-91	RES-CHIP	15K	5%	1/10W
R546	1-216-077-91	RES-CHIP	15K	5%	1/10W
R547	1-216-085-00	RES-CHIP	33K	5%	1/10W
R549	1-215-451-00	METAL	18K	1%	1/4W
R550	1-216-097-91	RES-CHIP	100K	5%	1/10W
R551	1-249-421-11	CARBON	2.2K	5%	1/4W
R552	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R553	1-215-457-00	METAL	33K	1%	1/4W
R554	1-215-457-00	METAL	33K	1%	1/4W
R556	1-215-437-00	METAL	4.7K	1%	1/4W
R558	1-249-421-11	CARBON	2.2K	5%	1/4W
R559	1-249-429-11	CARBON	10K	5%	1/4W
R560	1-216-073-00	RES-CHIP	10K	5%	1/10W
R562	1-249-401-11	CARBON	47	5%	1/4W
R565	1-216-073-00	RES-CHIP	10K	5%	1/10W
R567	1-216-105-91	RES-CHIP	220K	5%	1/10W
R568	1-249-383-11	CARBON	1.5	5%	1/4W
R570	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R571	1-215-437-00	METAL	4.7K	1%	1/4W
R573	1-216-089-91	RES-CHIP	47K	5%	1/10W
R577	1-215-913-11	METAL OXIDE	220	5%	3W
R578	1-216-369-00	METAL OXIDE	1	5%	2W
R579	1-216-097-91	RES-CHIP	100K	5%	1/10W

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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REF. NO.		PART NO.	DESCRIPTION			REMARK
R580		1-208-830-11	METAL CHIP	100K	0.5%	1/10W
R581		1-208-794-11	METAL CHIP	3.3K	0.5%	1/10W
R585		1-249-391-11	CARBON	6.8	5%	1/4W
R588		1-215-888-00	METAL OXIDE	220	5%	2W
R589		1-215-888-00	METAL OXIDE	220	5%	2W
R590		1-215-465-00	METAL	68K	1%	1/4W
R591		1-260-288-11	CARBON	0.47	5%	1/2W
R593		1-260-288-11	CARBON	0.47	5%	1/2W
R594		1-260-288-11	CARBON	0.47	5%	1/2W
R596		1-216-485-11	METAL OXIDE	5.6K	5%	3W
R597		1-247-750-11	CARBON	680	5%	1/2W
R598		1-249-438-11	CARBON	56K	5%	1/4W
R599		1-249-389-11	CARBON	4.7	5%	1/4W
R600		1-249-438-11	CARBON	56K	5%	1/4W
R601		1-249-418-11	CARBON	1.2K	5%	1/4W
R602		1-249-389-11	CARBON	4.7	5%	1/4W
R603		1-215-485-00	METAL	470K	1%	1/4W
R607		1-249-425-11	CARBON	4.7K	5%	1/4W
R608		1-240-205-91	CARBON	22M	5%	1/2W
R609		1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R610		1-216-073-00	RES-CHIP	10K	5%	1/10W
R611		1-216-089-91	RES-CHIP	47K	5%	1/10W
R612		1-216-045-00	RES-CHIP	680	5%	1/10W
R614		1-216-041-00	RES-CHIP	470	5%	1/10W
R615		1-216-350-11	METAL OXIDE	1.2	5%	1W
R616		1-260-302-51	CARBON	6.8	5%	1/2W
R617		1-247-791-91	CARBON	22	5%	1/4W
R619		1-260-128-11	CARBON	270K	5%	1/2W
R620		1-215-915-11	METAL OXIDE	470	5%	3W
R622		1-215-908-00	METAL OXIDE	33	5%	3W
R625		1-220-820-31	CEMENTED	1.5	5%	10W
R628		1-220-820-31	CEMENTED	1.5	5%	10W
R632		1-202-933-61	FUSIBLE	0.1	10%	1/2W
R634	⚠	1-218-265-11	METAL	8.2M	5%	1W
R635		1-216-492-11	METAL OXIDE	82K	5%	3W
R636		1-215-924-00	METAL OXIDE	15K	5%	3W
R637		1-216-492-11	METAL OXIDE	82K	5%	3W
R639		1-216-363-00	METAL OXIDE	0.33	5%	2W
R640		1-249-415-11	CARBON	680	5%	1/4W
R641		1-216-362-11	METAL OXIDE	0.27	5%	2W
R642		1-249-419-11	CARBON	1.5K	5%	1/4W
R643		1-247-843-11	CARBON	3.3K	5%	1/4W
R644		1-249-419-11	CARBON	1.5K	5%	1/4W
R646		1-215-924-00	METAL OXIDE	15K	5%	3W
R647		1-249-401-11	CARBON	47	5%	1/4W
R648		1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R649		1-249-417-11	CARBON	1K	5%	1/4W
R650		1-215-882-00	METAL OXIDE	22	5%	2W
R652		1-215-900-11	METAL OXIDE	22K	5%	2W
R653		1-215-873-00	METAL OXIDE	4.7K	5%	1W
R657		1-260-127-11	CARBON	220K	5%	1/2W
R659		1-216-049-91	RES-CHIP	1K	5%	1/10W
R660		1-216-073-00	RES-CHIP	10K	5%	1/10W
R661		1-215-873-00	METAL OXIDE	4.7K	5%	1W
R680		1-216-308-00	RES-CHIP	4.7	5%	1/10W
R901		1-249-411-11	CARBON	330	5%	1/4W
R902		1-249-411-11	CARBON	330	5%	1/4W
R903		1-216-022-00	RES-CHIP	75	5%	1/10W
R904		1-216-033-00	RES-CHIP	220	5%	1/10W
R905		1-216-113-00	RES-CHIP	470K	5%	1/10W
R906		1-216-077-91	RES-CHIP	15K	5%	1/10W
R909		1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R910		1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R911		1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R912		1-216-041-00	RES-CHIP	470	5%	1/10W
R913		1-216-049-91	RES-CHIP	1K	5%	1/10W
R914		1-216-055-00	RES-CHIP	1.8K	5%	1/10W
R915		1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R916		1-216-017-91	RES-CHIP	47	5%	1/10W
R917		1-216-041-00	RES-CHIP	470	5%	1/10W
R918		1-216-041-00	RES-CHIP	470	5%	1/10W
			<RELAY>			
RY601	⚠	1-755-214-11	RELAY, AC POWER			
			<SWITCH>			
S502		1-572-707-11	SWITCH, LEVER			
S600	⚠	1-571-433-21	SWITCH, PUSH (AC POWER)			
S901		1-692-431-21	SWITCH, TACTILE			
S902		1-692-431-21	SWITCH, TACTILE			
S903		1-692-431-21	SWITCH, TACTILE			
S904		1-692-431-21	SWITCH, TACTILE			
S905		1-692-431-21	SWITCH, TACTILE			
S906		1-692-431-21	SWITCH, TACTILE			
S907		1-692-431-21	SWITCH, TACTILE			
			<TRANSFORMER>			
T501		1-437-195-11	TRANSFORMER, HORIZONTAL DRIVE			
T503	⚠	1-453-293-11	TRANSFORMER ASSY, FLYBACK (NX-1748//M3A4)			
T601		1-424-682-11	TRANSFORMER, LINE FILTER			
T603	⚠	1-433-513-31	TRANSFORMER, CONVERTER (SRT)			
T604	⚠	1-431-852-11	TRANSFORMER, CONVERTER (SRT)			
			<THERMISTOR>			
THP600		1-810-961-11	THERMISTOR, POSITIVE			
			<TUNER>			
TU101		8-598-449-10	TUNER, FSS BTF-LG433			
			<CRYSTAL>			
X001		1-579-125-11	VIBRATOR, CERAMIC			
X301		1-781-134-21	VIBRATOR, CRYSTAL			
X302		1-781-132-21	VIBRATOR, CRYSTAL			

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The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

C3

REF. NO.		PART NO.	DESCRIPTION		REMARK
	*	A-1331-884-A	C3 BOARD MOUNTED		
			**********		
		7-682-948-01	SCREW +PSW 3X8		
			<CAPACITOR>		
C701		1-162-114-00	CERAMIC	0.0047UF 2KV	
C702		1-102-074-00	CERAMIC	0.001UF 10.00% 50V	
C703		1-107-651-11	ELECT	4.7UF 20.00% 250V	
C704		1-130-202-00	FILM	0.022UF 5.00% 400V	
C706		1-104-664-11	ELECT	47UF 20.00% 16V	
C708		1-102-114-00	CERAMIC	470PF 10.00% 50V	
C709		1-102-114-00	CERAMIC	470PF 10.00% 50V	
C710		1-102-114-00	CERAMIC	470PF 10.00% 50V	
C712		1-102-116-00	CERAMIC	680PF 10.00% 50V	
C713		1-102-116-00	CERAMIC	680PF 10.00% 50V	
C714		1-102-116-00	CERAMIC	680PF 10.00% 50V	
C716		1-126-933-11	ELECT	100UF 20.00% 16V	
C717		1-101-880-00	CERAMIC	47PF 5.00% 50V	
C736		1-102-114-00	CERAMIC	470PF 10.00% 50V	
C737		1-102-114-00	CERAMIC	470PF 10.00% 50V	
C746		1-102-114-00	CERAMIC	470PF 10.00% 50V	
			<CONNECTOR>		
CN701		1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P		
CN702		1-695-915-11	TAB (CONTACT)		
CN703	*	1-564-509-11	PLUG, CONNECTOR 6P		
CN704		1-695-915-11	TAB (CONTACT)		
			<DIODE>		
D701		8-719-911-19	DIODE 1SS119-25TD		
D702		8-719-911-19	DIODE 1SS119-25TD		
D703		8-719-911-19	DIODE 1SS119-25TD		
D707		8-719-911-19	DIODE 1SS119-25TD		
D708		8-719-911-19	DIODE 1SS119-25TD		
D709		8-719-911-19	DIODE 1SS119-25TD		
D710		8-719-911-19	DIODE 1SS119-25TD		
D711		8-719-911-19	DIODE 1SS119-25TD		
D712		8-719-911-19	DIODE 1SS119-25TD		
D713		8-719-911-19	DIODE 1SS119-25TD		
D714		8-719-911-19	DIODE 1SS119-25TD		
D715		8-719-911-19	DIODE 1SS119-25TD		
D716		8-719-911-19	DIODE 1SS119-25TD		
D717		8-719-929-15	DIODE RD9.1ES-T1B		
			<JACK>		
J701	⚠	1-540-071-22	SOCKET, CRT		
			<COIL>		
L701		1-410-667-31	INDUCTOR	22UH	
L710		1-408-613-31	INDUCTOR	68UH	
L711		1-408-613-31	INDUCTOR	68UH	
L712		1-408-613-31	INDUCTOR	68UH	

REF. NO.	PART NO.	DESCRIPTION			REMARK
		<TRANSISTOR>			
Q704	8-729-326-11	TRANSISTOR 2SC3271F-N			
Q705	8-729-326-11	TRANSISTOR 2SC3271F-N			
Q706	8-729-326-11	TRANSISTOR 2SC3271F-N			
Q707	8-729-200-17	TRANSISTOR 2SA1091O-TPE2			
Q708	8-729-200-17	TRANSISTOR 2SA1091O-TPE2			
Q709	8-729-200-17	TRANSISTOR 2SA1091O-TPE2			
Q710	8-729-119-78	TRANSISTOR 2SC2785TP-HFE			
Q711	8-729-119-78	TRANSISTOR 2SC2785TP-HFE			
Q712	8-729-119-78	TRANSISTOR 2SC2785TP-HFE			
		<RESISTOR>			
R703	1-249-496-11	CARBON	100K	5%	1/2W
R705	1-216-380-11	METAL OXIDE	8.2	5%	2W
R706	1-215-417-00	METAL	680	1%	1/4W
R707	1-215-413-00	METAL	470	1%	1/4W
R708	1-216-379-11	METAL OXIDE	6.8	5%	2W
R710	1-215-922-11	METAL OXIDE	6.8K	5%	3W
R711	1-247-752-11	CARBON	1K	5%	1/2W
R712	1-215-922-11	METAL OXIDE	6.8K	5%	3W
R713	1-247-752-11	CARBON	1K	5%	1/2W
R714	1-215-922-11	METAL OXIDE	6.8K	5%	3W
R715	1-247-752-11	CARBON	1K	5%	1/2W
R719	1-215-480-00	METAL	300K	1%	1/4W
R720	1-249-923-11	CARBON	1K	5%	1/4W
R721	1-215-489-00	METAL	680K	1%	1/4W
R722	1-249-923-11	CARBON	1K	5%	1/4W
R723	1-215-479-00	METAL	270K	1%	1/4W
R724	1-249-923-11	CARBON	1K	5%	1/4W
R725	1-249-421-11	CARBON	2.2K	5%	1/4W
R726	1-249-421-11	CARBON	2.2K	5%	1/4W
R727	1-249-421-11	CARBON	2.2K	5%	1/4W
R728	1-249-407-11	CARBON	150	5%	1/4W
R729	1-249-407-11	CARBON	150	5%	1/4W
R730	1-249-407-11	CARBON	150	5%	1/4W
R731	1-249-407-11	CARBON	150	5%	1/4W
R732	1-249-407-11	CARBON	150	5%	1/4W
R733	1-249-406-11	CARBON	120	5%	1/4W
R734	1-247-739-11	CARBON	100	5%	1/2W
R738	1-247-807-31	CARBON	100	5%	1/4W
R739	1-247-807-31	CARBON	100	5%	1/4W
R740	1-247-807-31	CARBON	100	5%	1/4W
R755	1-249-418-11	CARBON	1.2K	5%	1/4W
R756	1-249-418-11	CARBON	1.2K	5%	1/4W
R757	1-249-418-11	CARBON	1.2K	5%	1/4W
		<VARIABLE RESISTOR>			
RV702	1-241-656-11	RES, ADJ, METAL FILM 110M			

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The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

F VM1

REF. NO.		PART NO.	DESCRIPTION			REMARK
	*	A-1241-401-A	F BOARD MOUNTED			
			**********			
		1-533-223-11	CLIP, FUSE			
	*	4-374-846-01	COVER, CAPACITOR, CAP TYPE			
			<CAPACITOR>			
C654	⚠	1-117-703-11	CERAMIC	0.0047UF	99% 250V	
C4602	⚠	1-104-708-11	MYLAR	0.47UF	20.00% 250V	
			<CONNECTOR>			
CN4601	*	1-580-843-11	PIN, CONNECTOR (POWER)			
CN4602	*	1-580-843-11	PIN, CONNECTOR (POWER)			
CN4603		1-695-915-11	TAB (CONTACT)			
			<FUSE>			
F4601	⚠	1-532-237-00	FUSE, TIME-LAG (BET) 3.15A/250V			
			<RESISTOR>			
R4601	⚠	1-202-719-00	SOLID	1M	10% 1/2W	
			<TRANSFORMER>			
T4601		1-424-682-11	TRANSFORMER, LINE FILTER			
			<VARISTOR>			
VDR461		1-803-830-11	VARISTOR (ERZV14D621)			
			**********			
	*	A-1342-453-A	VM1 BOARD MOUNTED			
			**********			
		4-382-854-11	SCREW (M3X10), P, SW (+)			
			<CAPACITOR>			
C5902		1-104-661-91	ELECT	330UF	20.00% 16V	
C5903		1-161-830-00	CERAMIC	0.0047UF	500V	
C5905		1-126-925-11	ELECT	470UF	20.00% 10V	
C5906		1-130-491-00	MYLAR	0.047UF	5.00% 50V	
C5907		1-107-638-11	ELECT	33UF	20.00% 160V	
C5908		1-106-383-00	MYLAR	0.047UF	10.00% 200V	
C5909		1-126-933-11	ELECT	100UF	20.00% 16V	
C5910		1-130-471-00	MYLAR	0.001UF	5.00% 50V	
C5911		1-107-949-11	ELECT	2.2UF	20.00% 160V	
C5912		1-104-999-11	MYLAR	0.1UF	10.00% 200V	
C5913		1-130-471-00	MYLAR	0.001UF	5.00% 50V	
C5914		1-126-933-11	ELECT	100UF	20.00% 16V	
C5916		1-130-491-00	MYLAR	0.047UF	5.00% 50V	
C5917		1-126-925-11	ELECT	470UF	20.00% 10V	
C5918		1-115-341-51	CERAMIC	120PF	10.00% 500V	
C5920		1-126-964-11	ELECT	10UF	20.00% 50V	
C5921		1-101-888-00	CERAMIC	68PF	5.00% 50V	
			<CONNECTOR>			
CN5901	*	1-564-510-11	PLUG, CONNECTOR 7P			
CN5904	*	1-770-723-11	CONNECTOR, BOARD TO BOARD 8P			
			<DIODE>			
D5901		8-719-911-19	DIODE 1SS119-25TD			
D5902		8-719-110-88	DIODE MTZJ-T-77-39			
D5903		8-719-911-19	DIODE 1SS119-25TD			
D5904		8-719-110-88	DIODE MTZJ-T-77-39			
D5905		8-719-911-19	DIODE 1SS119-25TD			
D5906		1-249-406-11	CARBON	120	5% 1/4W	
D5907		1-249-406-11	CARBON	120	5% 1/4W	
			<COIL>			
L5901		1-414-187-11	INDUCTOR	47UH		
L5902		1-414-856-11	INDUCTOR	10UH		
			<TRANSISTOR>			
Q5901		8-729-230-45	TRANSISTOR 2SC2458TP-YGR			
Q5902		8-729-809-26	TRANSISTOR 2SA1606-E			
Q5903		8-729-230-45	TRANSISTOR 2SC2458TP-YGR			
Q5904		8-729-119-76	TRANSISTOR 2SA1175TP-HFE			
Q5905		8-729-230-45	TRANSISTOR 2SC2458TP-YGR			
Q5906		8-729-809-29	TRANSISTOR 2SC4159-E			
Q5908		8-729-119-78	TRANSISTOR 2SC2785TP-HFE			
Q5909		8-729-119-78	TRANSISTOR 2SC2785TP-HFE			
			<RESISTOR>			
R5901		1-247-815-91	CARBON	220	5% 1/4W	
R5902		1-249-414-11	CARBON	560	5% 1/4W	
R5903		1-247-735-11	CARBON	47	5% 1/2W	
R5904		1-249-411-11	CARBON	330	5% 1/4W	
R5905		1-249-417-11	CARBON	1K	5% 1/4W	
R5906		1-249-417-11	CARBON	1K	5% 1/4W	
R5907		1-249-417-11	CARBON	1K	5% 1/4W	
R5908		1-249-383-11	CARBON	1.5	5% 1/4W	
R5909		1-247-815-91	CARBON	220	5% 1/4W	
R5910		1-249-403-11	CARBON	68	5% 1/4W	
R5911		1-249-439-11	CARBON	68K	5% 1/4W	
R5912		1-249-437-11	CARBON	47K	5% 1/4W	
R5914		1-249-403-11	CARBON	68	5% 1/4W	
R5915		1-249-429-11	CARBON	10K	5% 1/4W	
R5916		1-249-419-11	CARBON	1.5K	5% 1/4W	
R5917		1-249-416-11	CARBON	820	5% 1/4W	
R5918		1-249-429-11	CARBON	10K	5% 1/4W	
R5919		1-249-417-11	CARBON	1K	5% 1/4W	
R5920		1-249-439-11	CARBON	68K	5% 1/4W	
R5921		1-215-912-11	METAL OXIDE	150	5% 3W	

The components identified by shading and mark ⚠ are critical for safety.
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VM1

REF. NO.	PART NO.	DESCRIPTION			REMARK
R5922	1-249-414-11	CARBON	560	5%	1/4W
R5923	1-249-383-11	CARBON	1.5	5%	1/4W
R5925	1-249-401-11	CARBON	47	5%	1/4W
R5929	1-215-880-00	METAL OXIDE	10	5%	2W
R5930	1-249-413-11	CARBON	470	5%	1/4W
R5931	1-249-413-11	CARBON	470	5%	1/4W
R5932	1-249-413-11	CARBON	470	5%	1/4W
R5933	1-249-413-11	CARBON	470	5%	1/4W
R5934	1-249-430-11	CARBON	12K	5%	1/4W
R5935	1-249-429-11	CARBON	10K	5%	1/4W

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MISCELLANEOUS
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A-1028-425-A	PACKING GROUP (SET)	
1-501-730-11	ANTENNA, TELESCOPIC	
1-417-151-21	MATCHING TRANSFORMER, ANTENNA	
1-569-008-21	ADAPTOR, CONVERSION 2P	
⚠ 1-416-946-11	COIL, DEMAGNETIC	
1-452-032-00	MAGNET,DISC	
⚠ 1-540-005-31	CAP ASSY, HIGH VOLTAGE	
1-503-902-41	SPEAKER (15X6.5CM)	
⚠ 1-574-062-11	CORD, POWER (WITH CONNECTOR) 2.5A/250V	
⚠ 8-735-809-05	PICTURE TUBE (A51LPT70X)	
⚠ 8-451-505-11	DEFLECTION YOKE (Y21RSA-S)	
8-453-011-31	NA299-S2	

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ACCESSORIES AND PACKING MATERIALS
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3-701-910-00	SCREW, SPECIAL (DIA. 3.8X20)	
3-865-870-13	MANUAL, INSTRUCTION	
4-392-003-11	BAND, HOLD	
4-392-004-11	CLIP	
* 4-039-372-01	BAG, PROTECTION	
* 4-067-165-01	CUSHION,(LOWER)(ASS'Y)	
* 4-067-166-01	CUSHION (UPPER)(ASS'Y)	
* 4-067-175-03	INDIVIDUAL CARTON	

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REMOTE COMMANDER
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1-418-163-11	REMOTE COMMANDER (RM-952)	
9-939-697-01	BATTERY COVER, REMOTE COMMANDER	

9-872-204-01

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